2002-06

# Analysis of Company Officer influence on midshipmen service assignment

Gille, Matthew G.

Monterey, Calif. Naval Postgraduate School

# NAVAL POSTGRADUATE SCHOOL
## Monterey, California


# THESIS

**ANALYSIS OF COMPANY OFFICER INFLUENCE ON MIDSHIPMEN SERVICE ASSIGNMENT**

by

Matthew G. Gille

June, 2002

| | |
|---|---|
| Thesis Advisor: | Steve Mehay |
| Second Reader: | Eric Fredland |

**Approved for public release; distribution is unlimited**

THIS PAGE INTENTIONALLY LEFT BLANK

| REPORT DOCUMENTATION PAGE | | | Form Approved OMB No. 0704-0188 |
|---|---|---|---|
| Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503. | | | |
| **1. AGENCY USE ONLY** ***(Leave blank)*** | **2. REPORT DATE**<br>June, 2002 | **3. REPORT TYPE AND DATES COVERED**<br>Master's Thesis | |
| **4. TITLE AND SUBTITLE**: Title (Mix case letters)<br>Analysis of Company Officer Influence on Midshipmen Service Assignment | | | **5. FUNDING NUMBERS** |
| **6. AUTHOR(S)**<br>Matthew G. Gille | | | |
| **7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)**<br>Naval Postgraduate School<br>Monterey, CA 93943-5000 | | | **8. PERFORMING ORGANIZATION REPORT NUMBER** |
| **9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES)**<br>N/A | | | **10. SPONSORING/MONITORING AGENCY REPORT NUMBER** |
| **11. SUPPLEMENTARY NOTES** The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government. | | | |
| **12a. DISTRIBUTION / AVAILABILITY STATEMENT**<br>Approved for public release; distribution is unlimited. | | | **12b. DISTRIBUTION CODE** |

**13. ABSTRACT** ***(maximum 200 words)***

This thesis explores the influence of Company Officers on midshipman service selection desires at the United States Naval Academy. This study looks at midshipman attraction to specific warfare communities through exposure to officers from each community. Four year groups from the Naval Academy were quantitatively analyzed to investigate the impact of the Company Officer upon midshipman service selection and to explore whether an individual is more likely to service select a warfare community that he/she is most exposed to by Company Officers while at the Naval Academy. Additionally, the Leadership, Education and Development (LEAD) Program was looked at to explore whether the Company Officers who graduated from the program were more likely than non-LEAD graduate Company Officers, to attract midshipmen to their respective warfare communities.

| **14. SUBJECT TERMS**<br>Vocational Choice, Career Influences, Warfare Community Selection | | | **15. NUMBER OF PAGES**<br>128 |
|---|---|---|---|
| | | | **16. PRICE CODE** |
| **17. SECURITY CLASSIFICATION OF REPORT**<br>Unclassified | **18. SECURITY CLASSIFICATION OF THIS PAGE**<br>Unclassified | **19. SECURITY CLASSIFICATION OF ABSTRACT**<br>Unclassified | **20. LIMITATION OF ABSTRACT**<br>UL |

NSN 7540-01-280-5500 Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. 239-18

THIS PAGE INTENTIONALLY LEFT BLANK

**Approved for public release; distribution is unlimited**

**ANALYSIS OF COMPANY OFFICER INFLUENCE ON MIDSHIPMEN SERVICE ASSIGNMENT**

Matthew G. Gille
LT, United States Navy
B.S., United States Naval Academy, 1996

Submitted in partial fulfillment of the
requirements for the degree of

**MASTER OF SCIENCE IN LEADERSHIP AND HUMAN RESOURCE DEVELOPMENT**

from the

**NAVAL POSTGRADUATE SCHOOL**
**June, 2002**

Author: Matthew G. Gille

Approved by: Steve Mehay, Thesis Advisor

Eric Fredland, Associate Advisor

Douglas A. Brook, Dean
Graduate School of Business and Public Policy

THIS PAGE INTENTIONALLY LEFT BLANK

# ABSTRACT

This thesis explores the influence of Company Officers on midshipman service selection desires at the United States Naval Academy. This study looks at midshipman attraction to specific warfare communities through exposure to officers from each community. Four year groups from the Naval Academy were quantitatively analyzed to investigate the impact of the Company Officer upon midshipman service selection and to explore whether an individual is more likely to service select a warfare community that he/she is most exposed to by Company Officers while at the Naval Academy. Additionally, the Leadership, Education and Development (LEAD) Program was looked at to explore whether the Company Officers who graduated from the program were more likely than non-LEAD graduate Company Officers, to attract midshipmen to their respective warfare communities.

THIS PAGE INTENTIONALLY LEFT BLANK

# TABLE OF CONTENTS

THIS PAGE INTENTIONALLY LEFT BLANK

# LIST OF FIGURES

THIS PAGE INTENTIONALLY LEFT BLANK

# LIST OF TABLES

THIS PAGE INTENTIONALLY LEFT BLANK

# ACKNOWLEDGMENTS

The author would like to thank his wife, Taryn, for her constant support, motivation, and help throughout this project.

# I. INTRODUCTION

## A. BACKGROUND

From the midshipmen's first day at the Naval Academy, Induction Day, until graduation they are constantly learning and preparing to become officers in the United States military. This preparation takes many forms: from academics to participation in varsity or intramural sports; from extra-curricular activities to leadership opportunities within the brigade; from attending Professional Development classes to observing others. The means that midshipmen employ to prepare for their lives as officers in the Navy and Marine Corps are as varied and diverse as the midshipmen themselves.

While at the Naval Academy, the professional development of midshipmen is closely monitored by their Company Officer. The Company Officer serves as a mentor to the 140+ midshipmen within his/her company and ensures that the midshipmen have adequate skills to become effective members of the officer community in naval services. Company Officers have completed at least one sea tour, have been commissioned a minimum of five years, and have experience leading other officers and enlisted personnel in the fleet.

Prior to the final semester at the Naval Academy, all physically qualified midshipmen must choose a warfare community in which to continue their training as officers. The warfare communities currently available for physically qualified midshipmen are: Surface Warfare, Submarine Warfare, Aviation Warfare, Marine Corps, Special Warfare or Special Operations. These warfare communities are constantly in competition with one another to attract the finest future officers from the Brigade of Midshipmen. These warfare communities are not only in competition to attract the most outstanding members of each graduating class at the Naval Academy, they are also under pressure to attract the appropriate number of midshipmen to meet specific community manning requirements.

In an effort to attract the finest midshipmen and meet the manning requirements of the community, warfare community managers look to the officer representatives of the specific warfare specialties at the Naval Academy to meet this demand. These warfare

representatives promote the community and educate the midshipmen about the opportunities and challenges associated with selecting a specific warfare community. On the other hand, the company officers are tasked by the Naval Academy administration to play the role of "honest broker" (company officer handbook, COMDTMIDN INST 5370.2) when educating the midshipmen about fleet communities, rather than promoting a specific community.

## B. PURPOSE OF STUDY

Because the Company Officer is one of the few officers at the Naval Academy that midshipmen interact with on a daily or near daily basis, the Company Officer undoubtedly takes on the role of instructor, advisor, disciplinarian and role model (company officer handbook, COMDTMIDN INST 5370.2). Because the Company Officer takes on the role of mentor and role model for many midshipmen with whom he/she comes in contact it is inevitable that the Company Officer will influence the service selection choice of the midshipmen in his/her company. This study is being conducted to explore the influence that the Company Officers have upon midshipmen service assignment desires. Furthermore, the new Company Officers training program, the Leadership, Education and Development (LEAD) Program, was introduced in 1997 and will be included in this study. An additional purpose of this study will be to analyze whether the officer graduates of the LEAD program are more influential on the midshipmen service selection desires than Company Officers were prior to the implementation of the LEAD Program.

## C. RESEARCH QUESTIONS

This study attempts to answer two primary questions: (1) To what extent does exposure to a Company Officer and the warfare specialty of the Company Officer affect midshipmens' service assignment? (2) Do Company Officers who are LEAD program graduates have more, less or the same effect on midshipmen service assignment as non-LEAD program graduates? This study will utilize data modeling and quantitative analysis techniques to explore the influence that Company Officers have on midshipmen service assignment. The analysis will focus on data that are available for midshipmen who have attended the Naval Academy during the past 10 years.

## D. BENEFITS OF STUDY

This study will explore the influence that Company Officers have upon midshipmen service selection desires through interaction and familiarization with the Company Officer's warfare community. The results of this research will support one of two conclusions. If the research finds the Company Officers are a major influence on midshipmen service selection, it would support the case for sending the fleet's top officers to the LEAD program and to serve as Company Officers so that the warfare communities have the best possible representation. If the research finds that exposure to Company Officers is not a major influence on midshipmen service selection desires but that a wide range of influences affect midshipmen attraction to various warfare communities, then the warfare community of the Company Officer should not be a criterion for assignment. Nevertheless, the fleet's top officers may still provide an outstanding environment for midshipmen professional development and their presence at the Naval Academy may still be warranted.

## E. SCOPE AND METHODOLOGY

The scope of this study includes a literature review of the vocational choices of young people and the various influences on these choices. The review also examines literature on the attraction of warfare communities to Naval Academy graduates. The data in this study have been collected from sources internal to the Naval Academy, including Institutional Research, Office of the Commandant, Performance Officer and the Department of Professional Development.

Once data were collected and a literature review was complete, a thorough data analysis was conducted using quantitative methods. Appropriate control variables were used to isolate the independent influence of Company Officer exposure on midshipmen service assignment.

## F. ORGANIZATION OF STUDY

This thesis uses quantitative analysis methods to explore the extent to which midshipmen exposure to Company Officers at the United States Naval Academy

affect midshipmen service selection desires. Chapter II includes a review of how people make career decisions and what factors influence those choices. Additionally, Chapter II also addresses the reason warfare communities are adamant about recruiting Naval Academy graduates to meet manning requirements instead of using other commissioning sources to meet demands. Chapter III addresses the sources and availability of data used in the quantitative analysis portion of this thesis and the explanatory variables utilized in the multivariate statistical analysis. Chapter IV presents the statistical results, including findings concerning the effect on service selection of Company Officers completing the LEAD program versus Company Officers who are non-LEAD program graduates. Chapter V presents conclusions from the study and recommendations for further research.

# II. LITERATURE REVIEW

## A. OVERVIEW

This study is being conducted to explore the potential influence of company officers upon the service selection desires of the Brigade of Midshipmen at the United States Naval Academy. This chapter focuses on the vocational choice influences on individuals throughout their adult development. While no research has been completed concerning the influences on midshipmen service assignment desires, substantial research has been completed regarding vocational choice influences on college age students and other young adults. Additionally, this chapter will address the midshipmen attraction to warfare community representatives who are recruiting officers to a career of service to their country in the Navy or Marine Corps.

## B. INFLUENCES UPON VOCATIONAL CHOICE

The vocational choice of an individual is affected by many factors encountered throughout his or her lifetime. Vocational choice is not an issue that is only faced by young adults trying to provide a living for themselves, but rather an issue that faces most people throughout their working years. From the childhood years, most Americans are under vocational influences as they attempt to fulfill their position in society and provide a standard of living for themselves and their family.

Since the founding of the United States, most citizens have felt an obligation to contribute to the society to which they belong, and fulfill the intrinsic qualities that they as citizens were raised to respect and strive for. This American work ethic embodies what is means to be a citizen and fulfill the concepts of individualism, industrialism and materialism within the society (Montana and Higginson, 1978).

Children in American society are imbued with the responsibility of contributing to society and providing for themselves upon reaching adulthood. Such pressures lead children to begin exploring potential vocations from an early age (Montana and Higginson, 1978). These societal pressures often manifest themselves in different forms from family members ("What do you want to be when you grow up?" or "You're out of

this house at age 18."). In addition to family members, other individuals may also have significant influences on the child's life (teachers, friends, mentors, religious leaders, etc.). Such influences prompt the individual to begin exploring potential vocational opportunities.

Undoubtedly the most familiar vocations to a young child are the vocations that his/her family members have chosen for themselves. The knowledge that the child has about his/her parent(s) vocation may serve to attract the child to the vocation (based solely on familiarity) or may serve to encourage the child to look elsewhere (based on the reality of the particular vocation). Although this familiarity with the family member's vocation has historically influenced young men to choose the same vocation and follow in their fathers' footsteps, such a choice can no longer be taken for granted (Montana and Higginson, 1978).

## C. TRANSITION TO ADULTHOOD AND ENTRY INTO THE WORKFORCE

Young adults are likely to experience a stage in their lives when they transition to the work force. This transition includes moving out of the family house and becoming a contributing member of society. The eventual goal is employment in an occupation which they personally find interesting and challenging and which provides them with the financial lifestyle they desire.

During this transition, most young people are willingly influenced by a number of individuals and in the process develop and realize their personal resources (Montana and Higginson, 1978). This influence from others usually takes one of three forms: 1) Actions of Others, 2) Recruitment of Others, and 3) Pushing Others Away (Phillips et al., 2001). The young person may actively seek the aid and guidance of someone he knows and trusts to help him make an important decision that could affect the rest of his life. The young person could also allow himself to be passively influenced by the actions of others through observation or some other form of involvement with influential others. Such an influence does not require direct interaction between the persons, but is a strictly passive means of influencing the developing individual. A third way the young person could be influenced by others in deciding a career path to follow is by actively excluding

specific individuals from the decision making process. This exclusion of others from the decision making could be brought about by witnessing undesirable career traits in them or placing little value on the potential input they could bring to the situation. A 2001 study reported that all participants in the study showed evidence of one of these themes during their transition to the work force and 86% of participants cited utilizing two of these themes during their transition (Phillips et al.)

The specific involvement and influence of an individual's parents during the period of time that the young person is gathering information about career opportunities and making the transition to the work force is particularly critical. When the young person is learning whom to turn to for advice and mentorship – friends, family members, teachers, significant others, etc. (over one half of the Phillips' study participants cited these individuals as a significant resource) – the most prominent and influential "others" cited by participants in the study were the individual's parents. Many times this transition to the work force can be viewed as a group or community event involving many others in the young person's life. Over half of the young people participating in the study cited being significantly "pushed or nudged" by others in a particular direction when faced with the career decision, and in the end this interaction and involvement by others was viewed as valuable from the decider's point of view (Phillips et al., 2001).

Such a transition is not necessarily made in a single step by all young people, but may include a period of time in college and/or military service (Montana and Higginson, 1978). This intermediate stage, or potentially final stage if a career is made of the military service, serves to bridge the gap from childhood to adult life by providing structure, control and support to the developing individual (Montana and Higginson, 1978).

## D. RECRUITMENT OF INDIVIDUALS INTO THE WORKFORCE

This section will focus on the actual recruitment influences upon civilian college students and graduating midshipmen at the United States Naval Academy. The influences of 1) candidate familiarity with the employer and 2) recruiter behavior will be addressed in this section with the assumption that civilian college students and midshipmen are recruited into the workforce in approximately the same manner.

However, before focusing on the influences upon these young people entering the workforce, the similarities in the factors that civilian college students and midshipmen take into account when making career decisions will be identified as well as the inherent problems with trying to compare these two groups of individuals.

### 1. Drawing parallels between midshipmen and civilian college students

Because no literature or research exists pertaining to the recruitment of midshipmen to specific warfare communities, focus was instead placed on research done in a similar environment, involving individuals of the same age as Naval Academy midshipmen. The available research focuses on the recruitment process of college students by private companies and the career decision influences upon soon to be college graduates. This research has much in common with the recruitment process of midshipmen at the Naval Academy by representatives of specific warfare communities and the subsequent service selection desires of the midshipmen.

However, there are some inconsistencies in attempting to compare the career influences upon civilian college students with the influences and decisions that must be made by midshipmen at the Naval Academy. The differences between the midshipmen and civilian college students with regard to career decisions include the following: 1) pay considerations, 2) influence of course work (i.e. major) while in college and 3) career options available to each group of graduates.

The civilian college student, when interviewing with various company recruiters, takes potential monetary compensation into account. These students have preconceived notions of the lifestyle they would like to maintain and the social position they intend to fill after college and routinely select occupations that provide for these desires (Montana and Higginson, 1978). Midshipmen, on the other hand, have already selected to be employed by the United States government as officers in the Navy or Marine Corps, and Congress has already determined their initial pay upon graduation. Therefore, with the exception of the Nuclear Training accession bonus (to approximately 15% of the graduating class), all graduates receive the same pay and allowances upon commissioning.

Despite the perceived difference in the influence of money upon civilian college students and Naval Academy midshipmen preparing to enter the workforce, research has shown that most civilian graduates select their first job based on opportunity, responsibility offered, the company's reputation and job location and not primarily on monetary compensation. (Montana and Higginson, 1978; Keller, Piotrowski and Rabold, 1990). This finding lends support to the argument that there are similarities between the factors that face civilian college students and midshipmen when making initial career decisions. Although midshipmen are able to determine the amount of monetary compensation they will receive throughout different stages of their career by looking at pre-determined pay and allowance tables, the monetary compensation has little to do with their career decisions. Midshipmen consider the opportunity and responsibilities available to them as the primary factors that determine which warfare specialty they desire to join.

Although there are differences between the potential employers of civilian college students and Naval Academy midshipmen, comparisons can be made between the similar situations that all of these students face prior to graduation. While it is obvious that the United States government will employ the Naval Academy graduates whereas civilian college students have many employers to choose from, the recruitment procedures of all of these individuals are very similar. Civilian college students choose an employer in their field of study that has made them a job offer and for whom they want to work by weighing their desires plus any tangible or intangible benefits associated with each employer. Similarly, Naval Academy midshipmen must choose which warfare community they want to join upon graduation/commissioning. This decision is based on their desires, which warfare communities they are physically qualified for (which warfare communities have offered them a job), and the tangible and intangible factors associated with becoming part of each community. In the end, both groups of individuals, civilian college students and midshipmen, are in a process to determine which job they will accept upon entering their respective workforce.

Additional similarities exist between college students and midshipmen in their efforts to determine which occupation or warfare specialty to pursue. Although there are many aspects of each job to consider when making such a decision, personality

preferences along with interaction with people in the particular field and/or site visits figured most prominently prior to making the final career decision. In a study concerning determinants of career selection among undergraduate students conducted by Keller, Piotrowski and Rabold (1990), the primary determinant of career choice was "matches my personality" (Keller, Piotrowski and Rabold, 1990, pg. 277). This determinant ranked higher than "income potential" and "financial security" by college students in the study, and indicates the importance of intangible aspects of an occupation over the monetary interests of the individual.

In addition to the importance of the chosen career matching the individual's personality, the importance of meeting people in the field in which the student or midshipmen is interested in cannot be ignored. While some studies suggest that site visits have little to do with the individual's attraction to an organization (Barber, 1998), other studies suggest that site visits, meeting with individuals from the organization, and internships have an undeniable effect on the individual's perception and attraction to the potential employer (Turban, 2001)(Rynes, 1991). Many students faced with career decisions have shown interest in meeting people already employed in particular fields to obtain information about what it is like to work for a particular employer. Information gathered from interactions with current employees of a company is interpreted as a "signal" of what it would be like to work for the organization. In addition, it allows the job candidate to get a feel for how the employer treats its employees (Turban, 2001).

Midshipmen are given the opportunity to experience the equivalent of a site visit/internship during their summers prior to graduation. These summer periods are used to introduce the midshipmen to different warfare communities within the Navy and Marine Corps. Some of the midshipmen's "site visits" are mandatory; however, other parts of the summer allow midshipmen the flexibility to choose which warfare community they want to spend time with. The summer training experiences allow the midshipmen to meet and interact with officers in a real world military environment and witness how the warfare community operates. These site visit experiences can further attract civilian college students or midshipmen due to the increased knowledge they have about the employer. On the other hand, the visit can also serve as a detractor and steer the candidates away from the particular employer/community based on a poor

experience. Whether the site visit serves to attract potential employees or causes them to reject an employment offer at some later time (Rynes, 1991), this experience has similar influence on career choices of civilian college students and Naval Academy midshipmen.

### 2. "Mere exposure" research and employer attractiveness

Another influence upon career choice for the civilian college student, which can also be extrapolated to the midshipman, is that the individual's familiarity with the employer leads to attraction to that particular employer. A substantial amount of evidence suggests that the more familiar someone is with a product, name or organization, the more positively the individual will evaluate the product or institution. Familiarity with an object or organization results from repeated exposure to the same and eventually leads to attraction to the object or organization.

$$\text{Exposure} \rightarrow \text{Familiarity}$$

and

$$\text{Familiarity} \rightarrow \text{Attraction}$$

Therefore

$$\text{Exposure} \rightarrow \text{Attraction}$$

The "mere exposure" research literature (Zajonc) was first introduced in 1968 and can be applied to individuals who are in the process of choosing an employer. Although this research was originally conducted in a non-military setting, the lessons learned can also be applied to midshipmen who are attempting to decide which warfare community to choose. When choosing an employer, applicants view familiar firms as more attractive employers (Gatewood et al., 1993) and applicants prefer the familiar (Aaker, 1996).

If applicants are attracted to the employers with whom they are familiar, and are more likely to accept employment offers from these attractive employers, how does the employer become attractive to potential employees? Aaker's research implies that employer attractiveness results from familiarity with the organization. Such familiarity can result from direct interactions or indirect interactions with the employer. Examples of direct interaction with the employer include knowing someone employed by the company, meeting employees on campus or through interactions with employees during a

site visit. Such direct interactions are not always available to candidates, and consequently candidates also form impressions about employers through indirect methods. Examples of indirect methods of obtaining information about an employer or forming initial impressions about an organization occur by talking with individuals from the campus placement center or from seeking counsel with other individuals. These individuals may have valuable information about a potential employer, and may be able to influence the future decisions by the candidates through such interactions. Turban (2001) recognizes the potential of indirect methods of obtaining information about an employer and makes recommendations to employers who are looking to maximize their attraction to potential candidates. Such recommendations include establishing ongoing relationships with campus placement centers and offering internship experiences for students. Students who had positive internship experiences are more likely to return to campus and talk positively about the organization to other students seeking information and forming opinions about that particular employer (Turban, 2001).

Civilian college students and midshipmen acquire information about potential employers or warfare communities from numerous sources. One of the most important direct methods of obtaining information and forming lasting impressions about an employer is through personal interaction with the employer or the employer's representatives. For midshipmen, this personal interaction occurs during summer training experiences or with warfare qualified officers serving at the Naval Academy. Sometimes the interaction with such individuals occurs in an informal setting or maybe by coincidence; other times the interaction is arranged as a formal interview. In this case the employer representative is actively filling the traditional role of recruiter when interviewing the candidates. In literature pertaining to recruitment of civilian college students into the workforce, these recruiters are found to use several methods to improve the image of the employer to the candidates.

### 3. Influence of the recruiter upon the applicant

Several studies have been conducted to explore the influence of recruiters upon candidate career choice. The findings from the studies suggest several different ways in which recruiters are able to positively influence potential candidates and make the

employer appear more attractive. One of the most influential ways of improving applicant perception of an organization is tied directly to the applicant's perception of the recruiter (Turban and Dougherty, 1992). The recruiter is most effective at influencing the candidate when the recruiter shows interest in the candidate and in the candidate's contributions. By doing so, the candidate views the recruiter more favorably and those views are likely to be extended to the employer.

While recruiter interest in the candidate and his/her accomplishments has been linked to employer attractiveness, recruiter behaviors demonstrated throughout the interview have also shown to impact employer attraction. Studies showed that those recruiters that displayed elements of "warmth, competence and informativeness" resulted in candidate attraction to the organization and in intentions to pursue employment with the company, "both overall company attractiveness and likelihood of accepting a job offer were predicted by recruiter warmth and businesslike manner." (Barber, 1998, pg.56)

Other studies of recruiter influences upon candidate attraction to potential employers focus on the information provided to the candidate during the interview process. Rynes and Miller (1983) found that the most reliable measure of candidate attraction to an employer is when specific information about the employer is relayed to the candidate by the recruiter. The features of the interview directly related to the job itself were much more important in creating a favorable impression and attraction to the organization than was recruiter's behavior. Elements of Rynes and Miller's study found that recruiter behavior did affect candidate attraction to the employer; however, the findings were not found to be consistently reliable in all studies conducted.

Although these data from the early 1980's suggested that recruiter behaviors were potential predictors of an applicant's attraction to the represented employer, data from the 1990's suggest that recruiter behavior has little to do with employer attraction. These more recent data suggests that the applicant's pre-interview attraction is a stronger predictor of post-interview attraction to the employer than recruiter behaviors during the interview (Powell, 1991; Turban, Forret and Hendrickson, 1998). If the recruitment process does little in changing the candidate's attraction to an employer (Lawler, Kuleck,

Rhode and Sorensen, 1975; Powell and Goulet, 1996), and pre-interview impressions are the most powerful predictors of an applicant's desire to interview with, undertake a site visit or accept a job offer, how does an employer ensure the organization's initial image to the candidates is a positive one? Although this question is of great importance in recruiting top applicants, little is known about what influences early impressions of an employer (Gatewood et al., 1993).

Because research has shown the importance of early impressions, and inconsistent results concerning recruiter behavior upon employer attractiveness, employers need to be aware of the importance of the initial contact between the employer and candidate. The way in which initial contact between the employer and candidate is made can take many forms, from initial screening interviews, to informal meetings with candidates on campus or off. Regardless of the forum in which the initial contact occurs, the employer needs to recognize that the first impressions of an organizations' employees can lead to the formation of opinions that are hard to dislodge later (Tversky and Kahneman, 1974).

## E. WHY RECRUITMENT OF NAVAL ACADEMY MIDSHIPMEN IS IMPORTANT TO WARFARE COMMUNITIES

Although three separate accession sources are used to provide officers in the naval service, the propensity of the officers from each of these sources to become career military officers is vastly different. A vast majority of Unrestricted Line (URL) naval service officers are acquired through one of three major accession sources, the United States Naval Academy, Navy Reserve Officer Training Corps (NROTC) and Officer Candidate School (OCS). Although the mission of each commissioning program is to provide qualified individuals for service in the officer corps of the naval services, the role in supporting the mission is different for each source. The use of reserve officers (NROTC and OCS graduates) to augment the regular commissioned officers (USNA graduates) was used as required to meet manning requirements of the expanding military following World War II. The professional differences resulting from the training of USNA and NROTC graduates were viewed as desirable complements. If all three of the officer accession sources provide competent junior officers to the fleet, why do warfare communities actively recruit each graduating midshipman from the Naval Academy?

Does the Naval Academy provide a different "product" to the fleet when compared to NROTC and OCS graduates?

One major difference is the propensity of Naval Academy graduates to make the Navy or Marine Corps a career. The need for large numbers of young officers to fill junior officer positions throughout the fleet is contrasted to the lower number of senior officers needed to fill the higher-level positions (O-6 and above) in each warfare community. USNA graduates have shown a propensity to remain in service and fill a higher percentage of senior officer billets than those filled by reserve officer accessions (Bowman, 1995). This desirable design outcome helps explain why warfare community representatives actively recruit USNA midshipmen.

In Bowman's study conducted in 1995, he notes that the "navy could fill its officer corps with officers from any single accession source and still be able to meet endstrength and force structure goals with sufficient numbers of high quality officers. The difference among these alternatives is the implied numbers of officers needed to be accessed to replace those separated" (pg. 66). His analysis of retention patterns supported the hypothesis that fewer USNA accessions are required to provide for a given number of senior officers. Table 1 presents required officer accessions to meet a required senior officer end strength of 100 officers assuming that all officers were accessed from a single source.

Table 1. Officer Accessions to Meet Required Senior Officer End Strength

| URL SOURCE | OFFICER GRADE | | | |
|---|---|---|---|---|
| | O-1 TO O-3 | O-4 | O-5 | O-6 |
| USNA | 670 | 274 | 185 | 100 |
| NROTC | 1286 | 425 | 249 | 100 |
| OCS | 1500 | 416 | 226 | 100 |

Source: Bowman (1995)

By focusing recruiting efforts at the Naval Academy, the Navy could conceivably access a higher percentage of officers dedicated to a career of naval service and who have the propensity to fill the role of a senior officer during their career in the Navy than officer accessions from NROTC or OCS sources. Stated differently, Table 1 shows that

fewer accessions from USNA are needed to produce 100 Navy Captains (O-6) than are needed from NROTC or OCS.

## F. CHAPTER SUMMARY

Although no research has been completed that addresses the factors that influence midshipmen service assignment desires, this chapter has introduced research that is relevant to the subject of this study. While a majority of the previous research presented in this chapter pertained to factors affecting civilian college students vocational choices, many of the findings can be applied to midshipmen who are faced with deciding which warfare community to join.

Some of the influences discussed in this chapter that impact the decisions of individuals who are preparing to enter the workforce include: impact of others, monetary compensation, personal experiences, recruiter behaviors, "mere exposure" and opportunities offered by the vocation. Although civilian college students and USNA midshipmen are entering two separate workforces with different experiences influencing their decisions, in general the influences upon these individuals are very similar.

The exposure to potential employers and influences of others greatly impacts the decision making of civilian college students as outlined in this chapter. This study is being conducted to explore the similar impact of influential persons (Company Officers) and exposure to different warfare specialties on midshipmen service selection desires.

# III. RESEARCH METHODOLOGY

This study is being conducted to explore the influence of exposure to Company Officers on Naval Academy midshipmen's service selection desires. This chapter addresses the sources of data used and the variables collected to undertake the quantitative analysis. In addition, this chapter includes the purpose and potential effects of the Leadership Education and Development (LEAD) program, the important assumptions made in this study, and the methodological approach used.

## A. SCOPE OF STUDY

Before in-depth research could be begun, the period of analysis of this study needed to be determined. After reviewing data files from IR, the OCM, the Performance Office, and Professional Development, it was obvious which years provided the most complete data necessary for analysis. The midshipmen data from IR was complete for the entire class of 1993 through 2001 with the exception of the midshipmen's company number. This shortcoming in the data is further explained in section C.1 below.

This study focuses on the most current data available. Focusing on data covering the past ten years seemed appropriate because the study would use the most recent data for the quantitative analysis. In addition, it would also allow for further analysis of the impact of the Leadership, Education and Development (LEAD) Program (which began in 1997) upon midshipmen service selection/assignment desires. The LEAD program is discussed in detail in the following section.

### 1. Leadership, Education and Development program

The LEAD program was initiated at the Naval Academy in June 1997. The LEAD program was designed as a modification to the Company Officer orientation and development program with hopes that the program would "result in significant positive improvements in the impact that company officers have on graduates of the United States Naval Academy" (Memorandum of Agreement, 1996). The LEAD Program was developed jointly by the Naval Academy and the Naval Postgraduate School (NPS) between 1995 and 1997 to meet a need for graduate education for prospective Company

Officers. The hope was that the education would prepare them to better meet the requirements of their upcoming job at the Naval Academy.

> The Leadership Education and Development curriculum prepares officers to develop leadership in others through knowledge of managing organizations, diagnosing individual and group performance, understanding learning processes, motivating subordinates, providing feedback and serving as positive role models. The curriculum was designed in response to a need for graduate education for Company Officers at the United States Naval Academy. The coursework provides knowledge and skills that officers will use as Company Officers as well as in other leadership roles as they become more senior in the military. (Course Description, NPS)

An orientation and development program for officers reporting to the Naval Academy as Company Officers was nonexistent before the initiation of the LEAD program. The additional year of schooling before becoming a Company Officer provides the officers in the program the opportunity to acclimate, or re-acclimate, themselves to the Naval Academy environment. By learning about the environment they will be working in before actually becoming a Company Officer, they can best prepare for the job and portray the most effective role model to the midshipmen.

Because no training program was in place prior to 1997 when the LEAD program was introduced, it would be advantageous to explore the influence of LEAD Program graduates' influence on midshipmen service community desires as compared to the influence of Company Officers in the pre-LEAD period. None of the Company Officers serving at the Naval Academy with the classes of 1993-1996 were LEAD Program graduates, whereas a majority of the Company Officers that interacted with the members of the class of 2001 were LEAD Program graduates. Therefore, a comparison can be made between the Company Officer's influence before versus after the initiation of the LEAD Program.

The null hypothesis concerning the impact of LEAD Program graduates is that the midshipmen will be more willing to desire a commission in the same warfare community as their Company Officer if the Company Officer is a graduate of the LEAD Program. This assumption is made due to the class work completed by the LEAD Program

graduate and skills acquired during the course of the program, and because the officer was given an entire year to acclimate to the environment of the Naval Academy.

## B. SOURCES OF DATA

Data for this study were collected from several sources at the Naval Academy. Sources of midshipmen and Company Officer data at the Naval Academy included: 1.) The Office of Institutional Research, Planning and Assessment (IR), 2.) Office of the Commandant of Midshipmen, 3.) The Performance Office and 4.) The Division of Professional Development. Most data pertaining to the midshipmen were collected from IR.

### 1. USNA Institutional Research

IR was founded in 1992 with the purpose of "evaluating and disseminating institutional data to stimulate positive changes to the admissions and education processes at the United States Naval Academy. IR is the single source of evaluated information on midshipmen and graduate performance" (USNA website). Midshipmen data collected from IR contained information on all midshipmen who were members of the graduating classes of 1993 through 2001. Although some of these midshipmen were at the Naval Academy prior to the founding of IR (the class of 1993 reported to the Naval Academy in the fall of 1989), historical data and variables of concern for the midshipmen dating back to 1989 were maintained on legacy systems before being formally organized by IR in 1992.

### 2. USNA Performance Office

The Performance Office provided only a small amount of data used in this study. The data collected from the Performance Office were used to "reconstruct" midshipmen's historical company record throughout their four years at the Naval Academy. The only midshipmen company data (for graduating classes 1993-2000) maintained by IR was the company of which the midshipman was a member upon graduation. The problem with this is that historically all midshipmen switch companies at least once during their four years at the Naval Academy. This changing of companies at some point during the four years at the Naval Academy has occurred since the mid 1940's. The reason for the

redistribution is explained by CAPT Michael D. Haskins, Commandant of Midshipmen: "Most importantly, I believe that the experience gained by establishing proper relationships and communication with unfamiliar personnel as a result of the redistribution is essential in preparing midshipmen for leadership roles in the fleet" (COMDTMIDN NOTICE 3120, 28 FEB 92). This changing of companies has historically been accomplished in one of two ways. First, members of a class within a company are "shuffled" to another company. For example: All of the members of the class of 1996 in the 30th company will transfer to the 11th company following their second year at the Naval Academy, and all of the members of the class of 1996 in the 11th company will transfer to the 30th company. Second, members of a class are randomly redistributed throughout the Brigade of Midshipmen or "shotgunned". The year groups used in this study were "shuffled" following their second year, with the exception of 2001. The class of 2001 was shotgunned prior to their second year. Fortunately, because a new database system was in use following the 1998 academic year, the historical company data for each midshipmen in the class of 2001 was retained and available for use in this study.

The Performance Office provided the company realignment data required to reconstruct each midshipman's company history and ultimately determine who the midshipman's company officer was each semester while at the Naval Academy. Company realignment data provided by the Performance Office is provided in the appendix and has been incorporated into the quantitative data analysis performed as part of this study.

Data received from the Performance Office also made it obvious that the midshipmen who were members of the Naval Academy classes of 1997 through 2000 could not be used in this study. The midshipmen in these classes were randomly redistributed throughout the Brigade of Midshipmen (some more than once) at some point during their four years at the Naval Academy; therefore, it was impossible to account for each company of which the midshipmen were members.

Additionally, in the summer of 1996, the Naval Academy experienced a downsizing in the Brigade of Midshipmen from 36 to 30 companies. The manner in

which the "extra" companies were dissolved and the midshipmen redistributed made it impossible to reconstruct the company history of the midshipmen of concern. This affected the members of 1997-1999 and the redistribution of these classes is summarized in TABLE 2:

Table 2. Redistribution of Class of 1997-2000

| Class of | Redistribution History |
|---|---|
| 1997 | - Downsized from 36 to 30 companies prior to fourth year. |
| 1998 | -"Shotgunned" prior to second year.<br>- Downsized from 36 to 30 companies prior to third year. |
| 1999 | - Downsized from 36 to 30 companies prior to second year. |
| 2000 | - "Shotgunned" prior to second year. |

Although the class of 2001 also experienced random reorganization during its time at the Naval Academy, the company data were maintained in a newer database system. This system allowed company historical data to be maintained from year to year instead of being overwritten each time the midshipmen changed company. Because the data were maintained on a newer system and the company data were historically documented, the class of 2001 was used in this study.

### 3. Office of the Commandant of Midshipmen

The Office of the Commandant of Midshipmen (OCM) provided valuable information concerning the Company Officers who served during the time period of this study. Data provided by the OCM was hand entered into a spreadsheet and linked to the midshipmen data using the company number. Data provided on Company Officers included: year/semester, company number, officer's name, and designator code. Designator codes for Unrestricted Line (URL) officers (Navy) include the following:

- 1100 General Unrestricted Line Officers
- 1110 Surface Warfare Officers
- 1120 Submarine Warfare Officers
- 1130 Special Warfare Officers
- 1140 Special Operations Officers

- 1310 Aviation Warfare Officer (Pilot)
- 1320 Aviation Warfare Officer (Naval Flight Officer)

Marine Corps officers in the data provided by the OCM were simply identified as "USMC" and not by a specific Marine Occupational Specialty (MOS) code. The Marine Corps officers were simply recoded as a group and not more specifically as pilots, flight officers or ground Marines.

Upon reviewing the Company Officer data received from the OCM, it was noted the no Special Operations Officers (1140) were present in the dataset. Because of a lack of 1140 officers in Company Officer billets during the time period of this analysis and the small number of Special Operations billets available to graduating midshipmen (8-12), the midshipmen receiving Special Operations commissions were removed from the study. Other midshipmen removed from the study were midshipmen who received interservice commissions or were commissioned into the Staff Corps (i.e. supply, medical communities), Restricted Line (i.e. Cryptology, Intelligence communities), Civil Engineering Corps, or as an Aviation Maintenance Duty Officer. These midshipmen were either not physically qualified for an unrestricted line community or selected to become a member of the Navy medical community. Because no Company Officers, in the data set analyzed, represent any of these communities, it was deemed appropriate to remove these midshipmen from the study. Foreign National midshipmen were also removed from this study.

Recoding of all of the Company Officer designator codes was used to simplify analysis and collect similar warfare specialties into a single group. Company Officers designator recoding was done before integrating the data with the midshipmen data from IR and company realignment data from the Performance Office. When recoding the Company Officer data, the Aviation Warfare officers (pilots and Naval Flight Officers ) were combined into one group for ease and accuracy of analysis. The influence of these pilots and flight officers upon midshipmen service selection desires were seen to be identical in influencing midshipmen to service select Aviation Warfare and not specifically as pilots or flight officers. Additionally, midshipmen may be physically disqualified to service select a specific specialty within that warfare community (i.e. due

to poor eyesight, the midshipmen is physically unable to become a pilot, but chooses to become an NFO because of the influence of a Company Office who was a pilot).

Recoding was completed as follows; Surface Warfare (1110) → 0, Aviation Warfare (1310 and 1320) → 1, Submarine Warfare (1120) → 2, USMC → 3, Special Warfare (1130) → 4, and General URL (1100) → 5. A summary of the recoding of Company Officer designator codes can be found in Table 3:

Table 3. Warfare Community Coding

| Warfare Community Coding |
|---|
| Surface Warfare=0 |
| Aviation Warfare=1 |
| Submarine Warfare=2 |
| USMC=3 |
| Special Warfare=4 |
| General URL = 5 |

This coding was used throughout the initial merging of midshipmen data and Company Officer data, but modified prior to final analysis. Prior to final analysis, the midshipmen who were most exposed to General Unrestricted Line officers during their time at the Naval Academy were dropped from the study. This was done because midshipmen are not permitted to service select a General URL commission upon graduation. Service communities available to graduating midshipmen are discussed in the following section of this study.

### 4. Professional Development Division

The Professional Development Division at the Naval Academy serves to prepare Midshipmen to be professional officers in the Naval and Marine Corps services (PRODEV website). One of the many aspects of completing this mission is being responsible to the Commandant of Midshipmen for the planning and execution of the service assignment process (COMDTMIDNINST 1301.1).

Data received from Professional Development Division addressed: 1) the service selection/assignment process, 2) communities available to graduating midshipmen and 3) percentage of midshipmen satisfied with their commissioning community.

The service selection process was used to allow midshipmen to choose the community in which to receive their commission; however, the service assignment process was initiated beginning with the class of 1995. Prior to 1995, service selection was based primarily on Order of Merit (OOM) of the midshipmen (OOM will be fully defined later in this study as part of the variable definitions). Although several other factors were taken into account prior to midshipmen service selection day (i.e., meeting minimum physical requirements for commissioning, completing and passing an interview with Naval Reactors, meeting minimum test requirements for selection into Aviation Warfare, or being previously selected for acceptance into the medical program) the service selection process was based mainly on OOM.

With the class of 1995 the service selection process was replaced by the service assignment process. This new process was initiated to best meet the needs of the Navy and Marine Corps by placing the best qualified midshipmen into the appropriate billets. This process was to take into account the needs of the naval service, the preferences of the midshipmen and the qualifications of the midshipmen (COMDTMIDNINST 1301.1). Service Assignment was designed as a four phase process, and the process was to be coordinated and executed by the Director, Division of Professional Development. This four stage process includes:

1. Interview Phase: The purpose of the interview phase is to provide objective information to the assignment boards regarding each midshipman's qualification for graduation.

2. Community Screening Phase: Community screening consists of medical screening and community specific academic, physical and professional screening.

3. Preference Designation Phase: This phase is when the midshipmen mark for record their service and community preferences from those communities for which they have been found qualified.

4. Assignment Phase: Service Assignment boards for each community will select the best qualified midshipmen from those applying. (COMDTMIDNINST 1301.1)

Service Assignment has remained in use by the Naval Academy for placing graduates into the fleet and has done so with a very high rate of satisfaction with graduating midshipmen. Graduating classes of 1998-2001 averaged 92.4% of the midshipmen receiving their first choice of community and 98.5% of the midshipmen receiving their first or second choice (PRODEV data).

Division of Professional Development also provided data concerning the communities available to midshipmen upon graduation. Beginning with the class of 1994, all physically qualified (PQ) midshipmen were required to select a URL community and midshipmen not meeting the physical requirements for commissioning into a URL community were required to select a Restricted Line (RL) community or Staff Corps (SC) community. The exceptions to this standard were the midshipmen specifically selected for a medical school billet. The communities available to midshipmen upon graduation are summarized in Table 4:

Table 4. Communities Available to Graduating USNA Midshipmen

| SERVICE SELECTION/ASSIGNMENT COMMUNITIES AVAILABLE TO GRADUATING MIDSHIPMEN |
|---|
| **UNRESTRICTED LINE:** |
| -SURFACE WARFARE (CONVENTIONAL) |
| - ENGINEERING DUTY (OPTION) |
| - OCEANOGRAPHY (OPTION) |
| - SURFACE WARFARE (NUCLEAR) |
| - SUBMARINE WARFARE |
| - SPECIAL WARFARE |
| - SPECIAL OPERATIONS |
| - AVIATION WARFARE (NFO) |
| - AVIATION WARFARE (PILOT) |
| **RESTRICTED LINE:** |
| - AVIATION MAINTENANCE DUTY OFFICER |
| - CRYPTOLOGY |
| - INTELLIGENCE |
| - OCEANOGRAPHY |
| - MEDICAL CORPS |
| - SUPPLY CORPS |
| - CIVIL ENGINEER CORPS |

## C. DATA SETS

This section will address the data received from IR, the OCM and the Performance Office, and will give descriptive analyses of the data sets.

### 1. Midshipmen data from Institutional Research

Although midshipmen data from 1993 through 2001 were available from IR, only the following year groups were used in this study: 1994, 1995, 1996, and 2001. The reason for not including year groups 1997 through 2000 was explained in detail above in section III.B.2. The year groups 1994-1996 and 2001 provided an adequate number of cases to facilitate analysis of Company Officer influence and the impact of the LEAD Program on midshipmen service selection desires.

All USNA midshipmen data were analyzed as a composite dataset, and separately by year group, to best explore the impact of exposure to Company Officers on midshipmen service selection desires and the possible influence of the LEAD Program. The composite set midshipmen data are briefly described in the following sections.

#### *a. Year group data 1994/1995/1996/2001*

Midshipmen data received from IR included all individuals who had attended the Naval Academy as a member of one of the year groups in this study. The initial data set of midshipmen (4501 cases) was reduced in order that only midshipmen who graduated and were commissioned into a URL community were included in the study (3300 cases). This data reduction was achieved by filtering non-graduating, foreign national, inter-service transfer, and RL or staff commissioned midshipmen from the data set. Additionally, midshipmen who were most exposed to General URL community officers while at the Naval Academy were also removed from the study. This was done to account for the fact that although midshipmen were exposed to these non-warfare qualified officers, midshipmen are required to service select/be assigned to warfare communities unless not physically qualified to receive such a commission.

The entire data set (3300 cases) was used in the analysis to identify whether the influence of Company Officers from specific warfare communities had any significant impact on midshipmen service selection/assignment. In addition to analyzing the four year groups as one large data set, individual year group data were analyzed to

determine specific year group demographics. Such demographics that were determined for each year group included:

- Gender percentages (GENDER).
- Number of midshipmen billeted to specific warfare communities from year to year (i.e. the number of aviation billets fluctuates year to year depending on the needs of the operational aviation squadrons/communities) (SERV_SEL).
- Percentage of midshipmen that were most exposed to Company Officers of different warfare communities (EXPOSED).
- Percentage of midshipmen that were at all exposed to Company Officers from their eventual service selection/assignment community (SERV_EXP).

In addition to providing a means of determining demographic data of the midshipmen in the dataset, the impact of Company Officer influence on different year groups could also be used in determining the impact of LEAD Program graduates on midshipmen service assignment.

### *b. Summary of midshipmen data set characteristics*

The final database of commissioned midshipmen from the graduating classes of 1994, 1995, 1996, and 2001 contained 3300 cases. As Table 5 shows , of the 3300 midshipmen in the study, 405 (12.3%) of the midshipmen were female.

Table 5. Gender Distribution within Data Set

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Male | 2895 | 87.7 | 87.7 | 87.7 |
| | Female | 405 | 12.3 | 12.3 | 100.0 |
| | Total | 3300 | 100.0 | 100.0 | |

The service selection/assignment accession requirements for each community vary somewhat from year to year depending upon forecasted operational requirements. The overall number and percentages of midshipmen commissioned into each URL warfare community are summarized in Table 6.

Table 6. Midshipmen Commissioned into each URL Warfare Community (SERV_SEL)

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Surfare Warfare | 1160 | 35.2 | 35.2 | 35.2 |
| | 1 Aviation Warfare | 1096 | 33.2 | 33.2 | 68.4 |
| | 2 Submarine Warfare | 388 | 11.8 | 11.8 | 80.1 |
| | 3 USMC | 595 | 18.0 | 18.0 | 98.2 |
| | 4 Special Warfare | 61 | 1.8 | 1.8 | 100.0 |
| | Total | 3300 | 100.0 | 100.0 | |

All midshipmen in this study were exposed to warfare qualified Company Officers while at the Naval Academy (if a midshipman was most exposed to non-warfare qualified Company Officers, he/she was removed from the study). The number of semesters in which they were exposed to different warfare community Company Officers was totaled, and the warfare community they were most exposed to was determined. The number and percentage of midshipmen in the data set that were most exposed (EXPOSED) to each warfare community are shown in the Table 7.

Table 7. Number and Percentage of Midshipmen that were most Exposed to each Warfare Community (EXPOSED)

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Surfare Warfare | 904 | 27.4 | 27.4 | 27.4 |
| | 1 Aviation Warfare | 956 | 29.0 | 29.0 | 56.4 |
| | 2 Submarine Warfare | 461 | 14.0 | 14.0 | 70.3 |
| | 3 USMC | 450 | 13.6 | 13.6 | 84.0 |
| | 4 Special Warfare | 75 | 2.3 | 2.3 | 86.2 |
| | 9 Split | 454 | 13.8 | 13.8 | 100.0 |
| | Total | 3300 | 100.0 | 100.0 | |

Of the 3300 midshipmen included in this study, 1136 (34.4%) midshipmen chose to service select/were assigned to the same warfare community that they were most exposed to by their Company Officers while at the Naval Academy (Table 8).

Table 8. Midshipmen who selected the warfare community they were most exposed to by their Company Officers (SAME)

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Different | 2165 | 65.6 | 65.6 | 65.6 |
| | 1 Same | 1135 | 34.4 | 34.4 | 100.0 |
| | Total | 3300 | 100.0 | 100.0 | |

Although 34.4% of graduating midshipmen chose the same warfare community as they were most exposed to, 57.2% of the midshipmen spent at least 1 semester exposed to a Company Officer of the warfare community they ultimately service selected/were assigned to (SERV_EXP). SERV_EXP data are summarized in Table 9.

Table 9. Number and Percentage of midshipmen exposed to their eventual service selection community (SERV_EXP)

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Not exposed at all | 1413 | 42.8 | 42.8 | 42.8 |
| | 1 Exposed | 1887 | 57.2 | 57.2 | 100.0 |
| | Total | 3300 | 100.0 | 100.0 | |

The average number of semesters that the midshipmen were exposed to their most exposed warfare community (SEMSTERS) was 4.42 semesters (Standard deviation=1.3 semesters). Table 10 summarizes the SEMSTERS data for the entire set.

Table 10. Number of Semesters that midshipmen were exposed to their most exposed to Warfare Community (SEMSTERS)

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 2 | 195 | 5.9 | 5.9 | 5.9 |
| | 3 | 251 | 7.6 | 7.6 | 13.5 |
| | 4 | 1920 | 58.2 | 58.2 | 71.7 |
| | 5 | 188 | 5.7 | 5.7 | 77.4 |
| | 6 | 518 | 15.7 | 15.7 | 93.1 |
| | 7 | 109 | 3.3 | 3.3 | 96.4 |
| | 8 | 119 | 3.6 | 3.6 | 100.0 |
| | Total | 3300 | 100.0 | 100.0 | |

### 2. Company Officer data from the Office of the Commandant

Data pertaining to the Company Officers at the Naval Academy concurrent with the midshipmen included this study were obtained from the OCM. The Company Officer data were analyzed in semester segments as it was assumed that only on a rare occasion did the Company Officer transfer during an academic semester. The warfare community of each Company Officer was determined using the designator code listed with each officer. This information was entered into a spreadsheet and cross-referenced with each midshipman to determine which warfare community the midshipman was exposed to throughout the semester.

Company Officer data collected from the OCM included the academic semesters fall 1989 through spring 2001. The extensive time period was required to account for the freshman ($4^{th}$ class) academic year of the class of 1993, through the graduating semester of the class of 2001. The number and percentage of qualified officers in each warfare community are listed in Table 11.

Table 11. Number and Percentage of Company Officers from each Navy URL community and USMC: Fall 1990 through Spring 2001

| ACADEMIC SEMESTER | WARFARE COMMUNITY | | | | | |
|---|---|---|---|---|---|---|
| | SWO | Aviation Warfare | Submarine Warfare | USMC | Special Warfare | General URL |
| FALL 1990 | 6(16.7%) | 10(27.8%) | 9(25%) | 7(19.4%) | 0(0%) | 4(11.1%) |
| SPRING 1990 | 9(25%) | 9(25%) | 8(22.2%) | 7(19.4%) | 0(0%) | 3(8.3%) |
| FALL 1991 | 8(22.2%) | 9(25%) | 9(25%) | 6(16.7%) | 0(0%) | 4(11.1%) |
| SPRING 1991 | 8(22.2%) | 10(27.8%) | 9(25%) | 6(16.7) | 0(0%) | 3(8.3%) |
| FALL 1992 | 7(19.4%) | 10(27.8%) | 9(25%) | 7(19.4%) | 0(0%) | 3(8.3%) |
| SPRING 1992 | 7(19.4%) | 10(27.8%) | 9(25%) | 7(19.4%) | 0(0%) | 3(8.3%) |
| FALL 1993 | 9(25%) | 10(27.8%) | 8(22.2%) | 6(16.7%) | 0(0%) | 3(8.3%) |
| SPRING 1993 | 12(33.3%) | 9(25%) | 7(19.4%) | 6(16.7%) | 0(0%) | 2(5.6%) |
| FALL 1994 | 10(27.8%) | 9(25%) | 7(19.4%) | 6(16.7%) | 1(2.8%) | 3(8.3%) |
| SPRING 1994 | 9(25%) | 12(33.3%) | 7(19.4%) | 6(16.7%) | 1(2.8%) | 1(2.8%) |
| FALL 1995 | 6(16.7%) | 11(30.6%) | 8(22.2%) | 6(16.7%) | 1(2.8%) | 4(11.1%) |
| SPRING 1995 | 7(19.4%) | 9(25%) | 8(22.2%) | 7(19.4%) | 1(2.8%) | 4(11.1%) |
| FALL 1996 | 8(22.2%) | 10(27.8%) | 9(25%) | 6(16.7%) | 1(2.8%) | 2(5.6%) |
| SPRING 1996 | 7(19.4%) | 10(27.8%) | 10(27.8%) | 6(16.7%) | 1(2.8%) | 2(5.6%) |
| FALL 1997 | 9(30%) | 7(23.3%) | 6(20%) | 6(20%) | 1(3.3%) | 1(3.3%) |
| SPRING 1997 | 9(30%) | 6(20%) | 6(20%) | 6(20%) | 2(6.7%) | 1(3.3%) |
| FALL 1998 | 11(36.7%) | 6(20%) | 6(20%) | 6(20%) | 1(3.3%) | 0(0%) |
| SPRING 1998 | 11(36.7%) | 5(16.7%) | 7(23.3%) | 6(20%) | 1(3.3%) | 0(0%) |
| FALL 1999 | 10(33.3%) | 9(30%) | 5(16.7%) | 6(20%) | 0(0%) | 0(0%) |
| SPRING 1999 | 10(33.3%) | 9(30%) | 5(16.7%) | 6(20%) | 0(0%) | 0(0%) |
| FALL 2000 | 9(30%) | 9(30%) | 5(16.7%) | 6(20%) | 1(3.3%) | 0(0%) |
| SPRING 2000 | 9(30%) | 9(30%) | 5(16.7%) | 6(20%) | 1(3.3%) | 0(0%) |
| FALL 2001 | 8(26.7%) | 8(26.7%) | 6(20%) | 7(23.3%) | 1(3.3%) | 0(0%) |
| SPRING 2001 | 8(26.7%) | 8(26.7%) | 6(20%) | 7(23.3%) | 1(3.3%) | 0(0%) |

Items of interest in the Company Officer data include:

1. No Special Warfare qualified officer served in a Company Officer billet until fall semester of academic year 1994. Therefore all midshipmen service selecting Special Warfare were not exposed to a Company Officer from that particular warfare community until at least the fall of 1993.

2. Following the spring semester 1997, no General URL officers were assigned to the Naval Academy as Company Officers. Midshipmen are unable to select General URL community upon graduation, therefore, midshipmen who were most exposed to General URL Company Officers were removed from the study.

## D. DATA INTEGRATION

Data received from IR, the OCM and the Performance Office were combined to construct a complete record for each graduating midshipman. Company

Officer data received from the OCM were integrated with the midshipmen data files from IR and company number data from the Performance Office using the company number of the midshipman and Company Officer. For example:

**Question:**

- Which URL community officer was MIDN "X" exposed to during the first semester of his/her 3rd Class year?

**Process:**

- MIDN "X" graduated from the 11th Company in 1996 (IR Data)
- All midshipmen graduating in 1996 changed companies during the summer of 1994 (Performance Office).
- During the summer of 1994, all midshipmen from 30th Company transferred to the 11th Company (Performance Office).
- LT "Y" was the Company Officer in 30th Company during the fall semester of the 1993-1994 academic year (OCM data).
- LT "Y" is a Submarine Warfare qualified URL officer (OCM data).
- OUTPUT: MIDN "X" was exposed to a Submarine Warfare qualified officer during the fall semester of his/her sophomore (3rd Class) year.

This process of integrating midshipmen data with Company Officer data was repeated for each semester of every midshipman's (year group 1993-1996) career at the Naval Academy. Year group 2001 data were similarly integrated; however, the company data did not have to be reconstructed using Performance Office data because company numbers were recorded for each semester of these midshipmen's time at the Naval Academy.

To integrate specific midshipmen data from each data source, a six digit string variable used to catalogue data for each midshipmen. This number, known as an "alpha number" to the midshipmen, is assigned to the midshipmen upon reporting to the Naval Academy as plebes and is used as a personal identifier throughout their time at the

Academy. This variable was used strictly for cataloguing purposes and merging data into the master file, and not used as a prediction variable during analysis.

## E. VARIABLES

Each of the variables used in this study is discussed in detail below:

### 1. Independent Variables

**EXPOSED**: This variable represents the warfare community that the midshipman was most exposed to (unit of measure: number of semesters) by his/her Company Officers. This variable has been coded as follows: Surface Warfare (conventional or nuclear) $\rightarrow$ 0, Naval Aviation Warfare (Pilot or NFO) $\rightarrow$ 1, Submarine Warfare $\rightarrow$ 2, Marine Corps (ground or aviation) $\rightarrow$ 3, Special Warfare $\rightarrow$ 4, Split between two or more communities (neither community being the same as the midshipman's eventual service selection) $\rightarrow$ 9. If the number of semesters that the midshipman was exposed to two or more different communities were equal, and one of the communities were the same as the midshipman's service selection, EXPOSED was coded the same as SERV_SEL.

**FRST_EXP**: This independent variable represents each midshipman's first semester freshman ($4^{th}$ class) year Company Officer's warfare community. This variable was used to explore whether the midshipman are more likely to service select/assign to the same community as their first Company Officer versus service selecting/assigning to the same community that they were most exposed to throughout their four years at the Academy.

**LAST_EXP**: This independent variable represents each midshipman's $1^{st}$ semester senior ($1^{st}$ class) year Company Officer's warfare community. This variable was used to explore whether the midshipmen are more likely to service select/assign to the same community as their last Company Officer before assignments or selections are made. This variable represents the $1^{st}$ semester of $1^{st}$ class year instead of the $2^{nd}$ semester because Service Selection/Assignment Night is typically very early in the final semester, and serious last minute deliberations are more likely to occur during the fall semester.

**SWO_EXP**: This binary variable was used to identify those midshipmen that were most exposed to surface warfare qualified Company Officers while at the Naval Academy. If the midshipman was most exposed to Surface Warfare Company Officers, then the value of one was assigned, otherwise the value of zero was assigned.

**AVIA_EXP**: This binary variable was used to identify those midshipmen that were most exposed to aviation warfare qualified Company Officers while at the Naval Academy. If the midshipman was most exposed to Aviation Warfare Company Officers, then the value of one was assigned, otherwise the value of zero was assigned.

**SUB_EXP**: This binary variable was used to identify those midshipmen that were most exposed to submarine warfare qualified Company Officers while at the Naval Academy. If the midshipman was most exposed to Submarine Warfare Company Officers, then the value of one was assigned, otherwise the value of zero was assigned.

**USMC_EXP**: This binary variable was used to identify those midshipmen that were most exposed to Marine Corps Company Officers while at the Naval Academy. If the midshipman was most exposed to Marine Corps Company Officers, then the value of one was assigned, otherwise the value of zero was assigned.

**SEAL_EXP**: This binary variable was used to identify those midshipmen that were most exposed to special warfare qualified Company Officers while at the Naval Academy. If the midshipman was most exposed to Special Warfare Company Officers, then the value of one was assigned, otherwise the value of zero was assigned.

**GENDER**: This variable was used to separate males and females within the midshipmen data sets. This variable was used as a dummy variable and recoded to zero and one. Males consisted of approximately 84-90% of each year group's data set and were recoded to zero and females to one. This variable applies only to the midshipmen and not to the Company Officers. Company Officer gender data were not maintained by IR or the OCM, and was not inferred from the available data. This independent variable was used to explore whether males or females are more likely to be influenced to service select the same warfare community as the Company Officers they were exposed to while at the Naval Academy. Another reason gender was identified as a variable and controlled

for throughout the study was due to the restriction on females serving in some warfare community billets (i.e. Special Warfare and Submarine Warfare).

**SERV_SEL**: This independent variable represents the warfare community to which the midshipmen were actually assigned. This variable has been coded as follows: Surface Warfare (conventional or nuclear) $\rightarrow$ 0, Naval Aviation Warfare (Pilot or NFO) $\rightarrow$ 1, Submarine Warfare $\rightarrow$ 2, Marine Corps (ground or aviation) $\rightarrow$ 3, Special Warfare $\rightarrow$ 4, All others $\rightarrow$ 5. Because midshipmen are required to service select/assign a URL community (unless Not Physically Qualified (NPQ)) and all Company Officers assigned to the Naval Academy are URL officers, all midshipmen coded with a 5 were removed from the study

**GROUP**: This numerical variable represents the academic division to which the midshipman's major belonged. The GROUP variable is reported as:

1: Engineering Division

2: Math and Sciences Division

3: Humanities and Social Science Division

This variable was used in controlling for academic majors that are more likely to be selected to attend a nuclear power interview with the Director of Naval Nuclear Power Program.

**MIL_FATH**: This string variable represents whether the midshipman's father had any previous military experience and of which military service he was a member. These data were self reported by the midshipmen to the Naval Academy and were used to further explore potential influences upon the midshipman's service selection desires. Because these data were self reported on the Naval Academy entrance questionnaire, these data were not confirmed.

**MIL_MOTH**: This string variable represents whether the midshipman's mother had any previous military experience and of which military service she was a member. These data were self reported by the midshipmen to the Naval Academy and were used to further explore potential influences upon the midshipman's service selection desires.

Because these data were self reported on the Naval Academy entrance questionnaire, these data were not confirmed.

**MIL_MID**: This string variable represents whether the midshipman had any military experience prior to entering the Naval Academy. These data were self reported by the midshipmen to the Naval Academy and were used to further explore potential influences upon the midshipman's service selection desires. Prior military experience also includes all midshipmen who attended the Naval Academy Preparatory School (prior Navy experience) before entering the Naval Academy. Because these data were self reported on the Naval Academy entrance questionnaire, these data were not confirmed.

**OOM**: This numerical variable is a means of individually ranking each midshipman within his or her respective class on a linear scale. OOM takes into account academic performance and military performance while at the Naval Academy and ranks the midshipman relative to his/her peers. This variable is reported on a linear scale from one through the number of midshipmen graduating in the class.

**CUM_AQPR**: This numerical variable represents the cumulative academic performance of the midshipman. This variable is reported on a scale of zero to four. This variable was used throughout the data analysis to control for academic requirements of certain warfare communities.

**CUM_MQPR**: This numerical variable represents the cumulative military performance of the midshipmen. This variable is reported on a scale of zero to four.

**SERV_EXP**: This binary variable was used to identify those midshipmen who were exposed to their eventual service selection warfare community for at least one semester.

**SERV_SEM**: This numerical variable represents the number of semesters that the midshipman was exposed to Company Officers in the same warfare community that the midshipman eventually service selected.

**SEMSTERS**: This numerical variable represents the number of semesters that the midshipman was exposed to Company Officers from his/her most exposed to warfare community.

**NAVY_FAM**: This binary variable was used to identify those midshipmen who have prior Navy service in their immediate family. This variable was used to explore the influence of, and control for, first hand knowledge of service in the Navy on service selection desires. If the midshipman or the midshipman's father or mother served in the Navy, then the value of one was assigned, otherwise the midshipman was assigned the value of zero.

**MC_FAM**: This binary variable was used to identify those midshipmen who have prior Marine Corps service in their immediate family. This variable was used to explore the influence of, and control for, first hand knowledge of service in the Marine Corps on service selection desires. If the midshipman or the midshipman's father or mother served in the Marine Corps, then the value of one was assigned, otherwise the midshipman was assigned the value of zero.

**MIL_BACK**: This binary variable was used to identify those midshipmen who have prior non-Naval military service in their immediate family. This variable was used to explore the influence of, and control for, first hand knowledge of non-Navy or Marine Corps service on service selection desires. If the midshipman or the midshipman's father or mother served in the military, but not in the Navy or Marine Corps, then the value of one was assigned, otherwise the midshipman was assigned the value of zero.

### 2. Dependent Variables

**SAME**: This binary variable was used to code midshipmen who had service selected/been assigned to the same warfare community as they were most exposed to by Company Officers while at the Naval Academy. This variable was used to explore whether extent of exposure has an impact on service selection/assignment desires.

$$\text{If SERV\_SEL} \neq \text{EXPOSED, then SAME} = 0$$

$$\text{If SERV\_SEL} = \text{EXPOSED, then SAME} = 1$$

**SAME2**: This binary variable was used in coding midshipman data to identify those midshipmen that service selected/were assigned to the same warfare community as their fall semester, freshman year Company Officer. This variable was used to explore

whether midshipmen are more likely to service select/be assigned to the same warfare community that they were first exposed to by their Company Officer.

If SERV_SEL ≠ FRST_EXP, then SAME2 = 0.

If SERV_SEL = FRST_EXP, then SAME2 = 1.

**SAME3**: This binary variable was used in coding midshipman data to identify midshipmen that service selected/were assigned to the same warfare community as their fall semester, senior year Company Officer. This variable was used to explore whether midshipmen are more likely to service select/be assigned to the same warfare community that they were last exposed to by their Company Officer prior to service selection/assignment final decisions must be made.

If SERV_SEL ≠ LAST_EXP, then SAME2 = 0.

If SERV_SEL = LAST_EXP, then SAME2 = 1.

**SWO_SLCT**: This binary variable was used to identify those midshipmen that service selected/were assigned to the surface warfare community.

If SERV_SEL= 0, then SWO_SLCT=1.

If SERV_SEL ≠ 0, then SWO_SLCT=0.

**AVI_SLCT**: This binary variable was used to identify those midshipmen that service selected/were assigned to the aviation warfare community.

If SERV_SEL= 1, then AVI_SLCT=1.

If SERV_SEL ≠ 1, then AVI_SLCT=0.

**SUB_SLCT**: This binary variable was used to identify those midshipmen that service selected/were assigned to the submarine warfare community.

If SERV_SEL= 2, then SUB_SLCT=1.

If SERV_SEL ≠ 2, then SUB_SLCT=0.

**USMC_SEL**: This binary variable was used to identify those midshipmen that service selected/were assigned to the Marine Corps.

If SERV_SEL= 3, then USMC_SEL=1.

If SERV_SEL ≠ 3, then USMC_SEL=0.

**SEAL_SEL**: This binary variable was used to identify those midshipmen that service selected/were assigned to the special warfare community.

If SERV_SEL= 4, then SEAL_SEL=1.

If SERV_SEL ≠ 4, then SEAL_SEL=0.

Table 12 describes the coding of all of the independent variables used in the study and lists the variable names.

Table 12. Summary of variables

| Variable Description | Variable Type | Variable Name | Possible Values |
|---|---|---|---|
| **Independent Variables** | | | |
| Warfare community most exposed to | Numerical | EXPOSED | 0,1,2,3,4 |
| First Company Officer's warfare community | Numerical | FRST_EXP | 0,1,2,3,4 |
| Last Company Officer's warfare community | Numerical | LAST_EXP | 0,1,2,3,4 |
| Most exposed to Surface Warfare | Binary | SWO_EXP | 0,1 |
| Most exposed to Aviation Warfare | Binary | AVIA_EXP | 0,1 |
| Most exposed to Submarine Warfare | Binary | SUB_EXP | 0,1 |
| Most exposed to USMC officers | Binary | USMC_EXP | 0,1 |
| Most exposed to Special Warfare | Binary | SEAL_EXP | 0,1 |
| Gender of midshipman | Binary | GENDER | 0,1 |
| Service selection community | Numerical | SERV_SEL | 0,1,2,3,4 |
| Academic major group | Numerical | GROUP | 1,2,3 |
| Military service of father | Categorical | MIL_FATH | A,N,AF,MC,NG,CG |
| Military service of mother | Categorical | MIL_MOTH | A,N,AF,MC,NG,CG |
| Military service of midshipman | Categorical | MIL_MID | A,N,AF,MC,NG,CG |
| Graduation order of merit | Continuous | OOM | 1-number in class |
| Academic grade point average | Continuous | CUM_AQPR | 0-4.0 |
| Military grade point average | Continuous | CM_MQPR | 0-4.0 |
| Exposure to eventual service selection community | Binary | SERV_EXP | 0,1 |
| Number of semesters exposed to evenutal service selection community | Continuous | SERV_SEM | 0-8 |
| Number of semesters exposed to most exposed warfare community | Continuous | SEMSTERS | 0-8 |

| | | | |
|---|---|---|---|
| Navy experience in family | Binary | NAV_FAM | 0,1 |
| Marine Corps experience family | Binary | MC_FAM | 0,1 |
| **Dependent Variables** | | | |
| Service selection community = most exposed community | Binary | SAME | 0,1 |
| Service selection community = first exposed community | Binary | SAME2 | 0,1 |
| Service selection community = last exposed community | Binary | SAME3 | 0,1 |
| Midshipman is a SWO selectee | Binary | SWO_SLCT | 0,1 |
| Midshipman is an Aviation selectee | Binary | AVI_SLCT | 0,1 |
| Midshipman is a Submarine selectee | Binary | SUB_SLCT | 0,1 |
| Midshipman is a Marine Corps selectee | Binary | USMC_SEL | 0,1 |
| Midshipman is a SEAL selectee | Binary | SEAL_SEL | 0,1 |

## F. ASSUMPTIONS MADE IN THIS STUDY

Some assumptions were made throughout this study. All of the assumptions were made because of less than complete data. Some of the shortcomings in data collection have been addressed and future studies will have the benefit of drawing from a complete midshipmen database, maintained by IR. The assumptions made in this study are addressed below, with an explanation of how the shortcoming was dealt with throughout the course of the study and the possible impact on this study. The first two assumptions are minor and have minimal impact on the findings of this study, however, the third assumption has a larger impact on the outcome of this study.

### 1. Shuffling of midshipmen

**Assumption**: *Midshipmen did not change companies for any reason other than as part of the Commandant's redistribution plan.*

**Explanation**: The database for the graduating classes of 1993-1996 maintained each midshipman's company data in a write-over format. The only company data available in IR's database was the company from which the midshipman graduated. If the midshipmen only changed companies as directed by the Commandant's redistribution policy, this data is reconstructable upon receiving the redistribution plans from the Performance Office. However, midshipmen are also forced to change companies for a

variety of other purposes (i.e. honor cases, fraternization policy requirements, personal reasons, etc). Although the redistribution of midshipmen on an individual basis is fairly rare, the movement of individuals within the Brigade of Midshipmen was impossible to reconstruct until the data were maintained in a more complete database system (starting with the class of 2001).

**Impact**: It is impossible to determine which midshipmen changed companies for reasons other than as directed by the Commandant's redistribution plan. This changing of companies on an individual basis interferes with the determination of which Company Officers/warfare community the midshipman was most exposed to while at the Academy. Because of the small number of midshipmen that are expected to fall into this category, the impact of this assumption is presumed to be minimal.

**2. Company Officer turnover occurs between academic semesters**

**Assumption**: *Company Officers conduct turnover of the company between semesters, not in the middle of semesters*.

**Explanation**: Company Officer data received from the OCM listed a single Company Officer for each company during any given semester. Although most Company Officers are relieved of their duties at the end of an academic semester or year, the possibility exists that for unforeseeable reasons a Company Officer turnover could occur in the middle of a semester.

**Impact**: The members of a company may not have been exposed to the same company officer/warfare community for the entire semester although the data in the set may reflect that the Company Officer was present for the entire time period. Using the time interval of academic semester vice academic year was chosen as the most appropriate time frame for analyzing Company Officer presence in the company and interactions with the midshipmen. The impact of this assumption is likely to be minimal.

**3. Midshipmen receiving desired warfare community.**

**Assumption**: *Midshipmen are commissioned into the warfare community that they find most desirable.*

**Explanation**: The service selection/assignment data used in this study only listed the warfare community that the midshipmen received upon graduation, and not necessarily the warfare community that the midshipman most desired. Service selection/assignment desires of the midshipmen (inputs from the midshipmen to the Professional Development Division) are available in databases including the classes of 1997 through present.

**Impact**: Although the eventual service selection/assignment community that the midshipman receives may not be the same as he/she most desired, a very high percentage of midshipmen do end up receiving one of their top choices of warfare communities. Data provided by Professional Development Division indicates that from 1998-2001, 92.4% of the graduating midshipmen received their first choice of community and 98.5% of the midshipmen receiving their first or second choice. Although a high percentage of the midshipmen receive one of their top two service communities, these data can be misleading. The Surface Warfare community can accept an unlimited number of graduating midshipmen, whereas many of the other warfare communities have a limit on the number of Naval Academy accessions each year. Additionally, midshipmen who are not chosen to become members of other warfare communities that they desire are assigned a commission in the Surface Warfare community (Surface Warfare becomes the default community for physically qualified midshipmen who are not accepted by another warfare community). In addition to the default aspect of the Surface Warfare community; midshipmen knowing they do not have the class standing to be competitive for billets in high demand (Special Warfare, Aviation), may put another one of their less desirable communities at the top of their warfare community selection list. This problem was unavoidable in this study because of the limitations of the data sources.

## G. METHODOLOGICAL APPROACH

The methodology used focused solely upon a quantitative analysis of the data collected and constructed for exploring the influence of the Company Officer exposure upon the midshipmen at the Naval Academy.

Prior to conducting a regression on the data collected, these data were analyzed to determine if the service selection options available to the midshipmen were distributed as

expected throughout the graduating class or not. To do this, a Chi-Square analysis was performed to determine if the actual distribution of service selection desires/outcomes were significantly different from the homogeneous (baseline) expectancy model.

After completing the Chi-Squared analysis, an attempt was made to model the midshipman's service selection desires based upon the exposure to warfare qualified Company Officers using logistic regression. The logistic regression methods were used because the dependent variables (see section Chapter 3, section III, D,2) in the analysis were all binary (1,0) variables. The logistic regression functions used in an attempt to model the midshipman's propensity to service select a particular warfare community were based upon the literature review conducted and included:

SWO_SLCT=*f* (SWO_EXP, AVIA_EXP, SUB_EXP, USMC_EXP, SEAL_EXP, CUM_AQPR, CUM MQPR, MC_FAM, NAVY_FAM, MIL_BACK, GENDER, GROUP)

AVI_SLCT= *f* (SWO_EXP, AVIA_EXP, SUB_EXP, USMC_EXP, SEAL_EXP, CUM_AQPR, CUM MQPR, MC_FAM, NAVY_FAM, MIL_BACK, GENDER, GROUP)

SUB_SLCT= *f* (SWO_EXP, AVIA_EXP, SUB_EXP, USMC_EXP, SEAL_EXP, CUM_AQPR, CUM MQPR, MC_FAM, NAVY_FAM, MIL_BACK, GENDER, GROUP)

USMC_SEL= *f* (SWO_EXP, AVIA_EXP, SUB_EXP, USMC_EXP, SEAL_EXP, CUM_AQPR, CUM MQPR, MC_FAM, NAVY_FAM, MIL_BACK, GENDER, GROUP)

SEAL_SEL= *f* (SWO_EXP, AVIA_EXP, SUB_EXP, USMC_EXP, SEAL_EXP, CUM_AQPR, CUM MQPR, MC_FAM, NAVY_FAM, MIL_BACK, GENDER, GROUP)

After determining the statistically significant variables for each of the dependent variables, an analysis to determine the impact of the LEAD Program was conducted. To determine the influence of LEAD Program graduates on midshipmen service selection

desires, the variables found to be statistically significant for the entire data set were analyzed for using a split data set.

The two data sets were divided to account for midshipmen who had no exposure to LEAD Program graduates and those midshipmen who were mostly exposed to Company Officers who were LEAD graduates. The pre-LEAD data set was comprised of midshipmen graduating in 1994, 1995, and 1996, whereas the post-LEAD data set was comprised of midshipmen from the graduating class of 2001.

The statistically significant variables were used in a logistic regression of the pre and post-LEAD data sets. The *B* coefficients from the regressions were used with the variable mean values to determine the marginal effect at the mean values of each variable in the regression. Then the marginal effect of the pertinent exposure variable (i.e. SWO_EXP for the SWO_SLCT regression) was compared between the two data sets to determine the effect of exposure to the pre-LEAD and post-LEAD Company Officers.

# IV. DATA ANALYSIS

## A. INTRODUCTION

This chapter addresses the computations and results of the quantitative analysis described in the previous chapter. The results presented in this chapter were obtained when attempting to determine the influence of the exposure of midshipmen to Company Officers.

This chapter includes initial indications of non-normal service selection distributions within the year groups analyzed in this study, Chi-Squared computations comparing the baseline and actual service selection distributions, and numerous logistic regression calculations. All calculations in this chapter were run using the entire four year (1994, 1995, 1996 and 2001) data set except where specifically noted.

## B. INITIAL INDICATIONS OF NON-NORMAL SERVICE SELECTION DISTRIBUTIONS

Prior to running any statistical analysis on the data set constructed, simple frequency analysis was conducted on various sets of filtered and unfiltered data. Many of these frequency outputs are indicative of other than random, or normal, distribution of service selection desires among the members of this study. These frequency analyses are explained individually in detail in the following sections.

### 1. SAME vs. SAME2 vs. SAME3

Initial frequency counts of the midshipmen that service selected the same warfare community as they were most exposed to while at the Navy Academy (SAME) indicated that 34.4% of the midshipmen did select the same warfare community as represented by a majority of their Company Officers. But the question of whether the SAME distribution was normal or other than normal still needed to be determined. In order to get an idea of whether this percentage of midshipmen was normal, additional comparative frequency analyses were conducted. The frequency analyses conducted addressed whether the midshipmen service selected the same warfare community as their first or seventh semester Company Officer (SAME2 and SAME3). These two variables were compared to the SAME variable to quickly get an idea of whether the 34.4% was indicative of a

typical distribution of midshipmen or whether being repeatedly exposed to Company Officers from a given warfare community had a potential impact on midshipmen service selection. The percentage of midshipmen that service selected the same community as their first or seventh semester Company Officer were 23.2% and 22.5%, respectively (Table 13). These results indicated that midshipmen were influenced to some degree by the Company Officer that they were most exposed to while at the Naval Academy.

Table 13. Midshipmen who service selected the same warfare community as they were exposed to by different Company Officers

**SAME (SERV_SEL = EXPOSED)**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Different | 2165 | 65.6 | 65.6 | 65.6 |
| | 1 Same | 1135 | 34.4 | 34.4 | 100.0 |
| | Total | 3300 | 100.0 | 100.0 | |

**SAME2 (SERV_SEL = FRST_EXP)**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Different | 2535 | 76.8 | 76.8 | 76.8 |
| | 1 Same | 765 | 23.2 | 23.2 | 100.0 |
| | Total | 3300 | 100.0 | 100.0 | |

**SAME3 (SERV_SEL = LAST_EXP)**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Different | 2558 | 77.5 | 77.5 | 77.5 |
| | 1 Same | 742 | 22.5 | 22.5 | 100.0 |
| | Total | 3300 | 100.0 | 100.0 | |

### 2. Midshipmen service selection distribution

The service selection communities available to the midshipmen were consistent throughout the year groups in this study. The number of commissioning billets available from year to year fluctuated depending on the current and forecasted needs of the naval service. However, when the EXPOSED variable in this data set was controlled for, the frequency with which midshipmen service selected/were assigned to various warfare communities appeared to be influenced by the EXPOSED variable.

The entire data set was filtered five separate times. Each time the filtered data set included only those midshipmen who were most exposed to a particular warfare community. In addition, females were filtered from the data set while performing these frequency analyses because only males are eligible to service select from all five warfare communities analyzed for in this study. For example, the first filtering of the data set resulted in only those male midshipmen who were most exposed to surface warfare officers remaining in the data set. Once this filtering was accomplished, a SERV_SEL frequency table was generated. This procedure was repeated for each warfare community that the male midshipmen could have been most exposed to, and a SERV_SEL frequency table was generated. Tables 14-18 provide the output from these frequency analyses:

Table 14. Service Selection distribution of those midshipmen most exposed to Surface Warfare Qualified Company Officers

**SERV_SEL (midshipmen service selection community)[a]**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Surfare Warfare | 333 | 42.9 | 42.9 | 42.9 |
| | 1 Aviation Warfare | 229 | 29.5 | 29.5 | 72.3 |
| | 2 Submarine Warfare | 102 | 13.1 | 13.1 | 85.5 |
| | 3 USMC | 102 | 13.1 | 13.1 | 98.6 |
| | 4 Special Warfare | 11 | 1.4 | 1.4 | 100.0 |
| | Total | 777 | 100.0 | 100.0 | |

a. EXPOSED = 0 Surfare Warfare

Table 15. Service Selection distribution of those midshipmen most exposed to Aviation Warfare Qualified Company Officers

**SERV_SEL (midshipmen service selection community)[a]**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Surfare Warfare | 202 | 23.9 | 23.9 | 23.9 |
| | 1 Aviation Warfare | 408 | 48.2 | 48.2 | 72.1 |
| | 2 Submarine Warfare | 96 | 11.3 | 11.3 | 83.5 |
| | 3 USMC | 127 | 15.0 | 15.0 | 98.5 |
| | 4 Special Warfare | 13 | 1.5 | 1.5 | 100.0 |
| | Total | 846 | 100.0 | 100.0 | |

a. EXPOSED = 1 Aviation Warfare

Table 16. Service Selection distribution of those midshipmen most exposed to Submarine Warfare Qualified Company Officers

**SERV_SEL (midshipmen service selection community)[a]**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Surfare Warfare | 123 | 30.0 | 30.0 | 30.0 |
| | 1 Aviation Warfare | 118 | 28.8 | 28.8 | 58.8 |
| | 2 Submarine Warfare | 101 | 24.6 | 24.6 | 83.4 |
| | 3 USMC | 62 | 15.1 | 15.1 | 98.5 |
| | 4 Special Warfare | 6 | 1.5 | 1.5 | 100.0 |
| | Total | 410 | 100.0 | 100.0 | |

a. EXPOSED = 2 Submarine Warfare

Table 17. Service Selection distribution of those midshipmen most exposed to Marine Corps Company Officers

**SERV_SEL (midshipmen service selection community)[a]**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Surfare Warfare | 107 | 27.0 | 27.0 | 27.0 |
| | 1 Aviation Warfare | 107 | 27.0 | 27.0 | 53.9 |
| | 2 Submarine Warfare | 37 | 9.3 | 9.3 | 63.2 |
| | 3 USMC | 140 | 35.3 | 35.3 | 98.5 |
| | 4 Special Warfare | 6 | 1.5 | 1.5 | 100.0 |
| | Total | 397 | 100.0 | 100.0 | |

a. EXPOSED = 3 USMC

Table 18. Service Selection distribution of those midshipmen most exposed to Special Warfare Qualified Company Officers

**SERV_SEL (midshipmen service selection community)[a]**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Surfare Warfare | 21 | 36.2 | 36.2 | 36.2 |
| | 1 Aviation Warfare | 18 | 31.0 | 31.0 | 67.2 |
| | 2 Submarine Warfare | 8 | 13.8 | 13.8 | 81.0 |
| | 3 USMC | 8 | 13.8 | 13.8 | 94.8 |
| | 4 Special Warfare | 3 | 5.2 | 5.2 | 100.0 |
| | Total | 58 | 100.0 | 100.0 | |

a. EXPOSED = 4 Special Warfare

The midshipmen in each filtered data set were most likely to select the particular warfare community to which they were most exposed by their Company Officers, and/or

more likely to choose that warfare community than midshipmen in any of the other filtered data sets. These outputs reinforce Zajonc's "Mere Exposure" findings and the hypothesis that midshipmen are attracted to the warfare community to which they are most exposed. Table 19 summarizes this information in a warfare community specific format.

Table 19. Warfare communities chosen by midshipmen that were most exposed to Company Officers of each warfare community

| SERVICE SELECTION COMMUNITY | MOST EXPOSED WARFARE COMMUNITIES | | | | |
|---|---|---|---|---|---|
| | SWO | AVIATION | SUBMARINE | USMC | SPECIAL |
| SWO | 42.9% | 23.8% | 30.0% | 27.0% | 36.2% |
| AVIATION | 29.5% | 48.3% | 28.8% | 27.0% | 31.0% |
| SUBMARINE | 13.1% | 11.3% | 24.6% | 9.3% | 13.8% |
| USMC | 13.1% | 15.0% | 15.1% | 35.3% | 13.8% |
| SPECIAL | 1.4% | 1.5% | 1.5% | 1.5% | 5.2% |
| | 100.0% | 99.9% | 100.0% | 100.1% | 100.0% |

Although the Submarine Warfare and Special Warfare do not strictly follow Zajonc's "mere exposure" hypothesis, the percentage of midshipmen who selected to become Submariners and SEALs after being most exposed to officers of these communities are much higher than midshipmen who were most exposed to Company Officers of other warfare communities. From this summary table, it is evident that midshipmen are being actively or passively influenced by their Company Officers when deciding which warfare community to service select.

### 3. Midshipmen who chose a warfare community to which they were exposed

After performing a frequency analysis described in section IV.B.1 it was obvious that the midshipmen were being influenced to some degree by their Company Officers while at the Naval Academy. This frequency analysis was taken one step further to account for those midshipmen who were never exposed to their service selection warfare community by a Company Officer.

Midshipmen are influenced by many sources, not just their Company Officers, when making their service selection decisions. The midshipmen who selected different warfare communities than they were exposed to by their Company Officers may have

been individuals who had made their service selection decision before reporting to the Naval Academy. They might not have been open to being significantly influenced or swayed to a particular warfare community by their Company Officers. The argument that these midshipmen were in fact influenced by their Company Officer can also be made, although the interaction between the midshipmen and Company Officer did not result in the midshipman selecting the same warfare community as his/her Company Officer. The Company Officer's behavior and leadership style may have influenced the midshipman to choose another warfare community but nonetheless the Company Officer's presence and interaction with the midshipmen had a significant influence on the service selection decision.

A frequency count analysis was conducted to determine the number and percentage of midshipmen who service selected the same warfare community as they were most exposed to by their Company Officers. The only difference between this frequency count and the SAME frequency count was that the data set was filtered and included only those midshipmen who were actually exposed to their eventual service selection community. The midshipmen who were never exposed to a Company Officer from their eventual service selection warfare community were removed from the data set and not included in the frequency analysis.

For comparison, frequency count analyses of the SAME2 and SAME3 variables were also conducted. These variables provided a baseline percentage of those midshipmen that selected the same community as their Company Officers. The relative results among the variables were very similar to the original SAME, SAME2 and SAME3 frequency counts. The frequency count on the variable SAME was approximately 50% greater than the baseline frequency counts for the variables SAME2 and SAME3. The frequency counts are shown in Tables 20-22.

Table 20. Midshipmen who were exposed to their service selection community and service selected the same community as their most exposed to warfare community

**SAME (SERV_SEL = EXPOSED)**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Different | 752 | 39.9 | 39.9 | 39.9 |
| | 1 Same | 1135 | 60.1 | 60.1 | 100.0 |
| | Total | 1887 | 100.0 | 100.0 | |

Table 21. Midshipmen who were exposed to their service selection community and service selected the same community as their first semester Company Officer

**SAME2 (SERV_SEL = FRST_EXP)**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Different | 1122 | 59.5 | 59.5 | 59.5 |
| | 1 Same | 765 | 40.5 | 40.5 | 100.0 |
| | Total | 1887 | 100.0 | 100.0 | |

Table 22. Midshipmen who were exposed to their service selection community and service selected the same community as their seventh semester Company Officer

**SAME3 (SERV_SEL = LAST_EXP)**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Different | 1145 | 60.7 | 60.7 | 60.7 |
| | 1 Same | 742 | 39.3 | 39.3 | 100.0 |
| | Total | 1887 | 100.0 | 100.0 | |

### 4. Non-Random service selection distribution conclusions

The frequency counts presented in the previous three sub-sections provide initial indications of a non-normal distribution of service selection desires among the Brigade of Midshipmen at the Naval Academy. Not only do the distributions appear to be other than normal, but there appears to be some dependence on the warfare community of the midshipmen's Company Officer. Although Company Officers appear to have an impact on the service selection desires of the midshipmen, this influence requires further evaluation to explore whether the relationship is mathematically significant.

## C. CHI-SQUARED TEST

Prior to attempting to develop a logistic regression model, additional analysis was necessary to determine if the distribution of midshipmen service selection was non-normal. In order to test the hypothesis that the distribution was non-normal, a Chi-Squared ($\chi^2$) test was used.

A $\chi^2$ test of independence is used to determine the independence between two discrete variables. The $\chi^2$ analysis compares the expected frequencies of a distribution with the actual distribution found in the data set being analyzed. The formula used in the $\chi^2$ analysis is:

$$S\ (f_o\text{-}F_e)^2/F_e \qquad \text{(Equation 1)}$$

where $f_o$ represents the observed cell frequency and $F_e$ represents the expected cell frequency. The summation of the formula is used to account for all cells in a two-way table.

The $\chi^2$ test results in a number greater than zero, and is compared to a critical value to determine if the resulting $\chi^2$ value is significant or insignificant. The null hypothesis that is tested with a $\chi^2$ analysis is that the variables in question are independent of one another. If the resulting $\chi^2$ value is less than the critical value for the desired level of significance (typically the .05 or .01 level) then the null hypothesis can be retained; the variables are independent of one another. However, if the resulting $\chi^2$ value is greater than the critical value for the desired level of significance, then the null hypothesis should be rejected because the variables are related or dependent on one another.

### 1. Constructing the data tables for Chi-squared analysis

In order to conduct a $\chi^2$ analysis of the data and determine whether the service selection distribution was independent or dependent upon Company Officer exposure, the baseline/expected table, and the actual table of midshipmen service selection distribution had to be constructed. Values from these two tables were used in the $\chi^2$ analysis to

determine if Company Officer exposure was independent of eventual midshipmen service selection.

### *a. The baseline distribution Chi-squared table*

Because the number of midshipmen that service select a given warfare community each year and the number of qualified Company Officers from each warfare community are different each year, an equal distribution of service selection vs. Company Officer exposure was not expected. The baseline table used for the $\chi^2$ analysis was constructed using the percentage of midshipmen that service selected each warfare community (SERV_SEL) and the percentage of midshipmen that were most exposed to Company Officers of each warfare community (EXPOSED). These percentages were multiplied together to make a 5 X 5 matrix of the expected service selection distribution. This data is shown in Table 23:

Table 23. Expected Service Selection Chi-Squared Distribution

**Baseline: Random Distribution within Brigade**

| | | EXPOSED | | | | |
|---|---|---|---|---|---|---|
| | | SWO | Aviator | Submariner | USMC | SEAL |
| SERV_SEL | SWO | 11.09% | 11.72% | 5.65% | 5.51% | 0.91% |
| | Aviator | 10.80% | 11.41% | 5.50% | 5.37% | 0.88% |
| | Submariner | 3.84% | 4.06% | 1.96% | 1.91% | 0.31% |
| | USMC | 5.63% | 5.95% | 2.87% | 2.80% | 0.46% |
| | SEAL | 0.44% | 0.46% | 0.22% | 0.22% | 0.04% |

Table 23 did not include any female data cases or cases of midshipmen who were most exposed to more than one warfare community that they did not eventually service select. The percentages presented in Table 23 represent the percentage of midshipmen that will service select a particular warfare community and be most exposed to a given warfare community. For example: it is expected that 11.09% of midshipmen will become Surface Warfare Officers and be most exposed to Company Officers qualified as a Surface Warfare Officer, and 10.8% of all midshipmen will become Aviation Warfare Officers and be most exposed to Company Officers qualified as a Surface Warfare Officer.

Table 23 indicates that a high percentage of the midshipmen will become members of the Aviation Warfare community or Surface Warfare community and that these midshipmen are likely to be most exposed to Aviation Warfare officers or Surface Warfare officers (total: 45.02%). Another characteristic of Table 23 is that by the

percentages, a midshipmen that enters any community is most likely to have been most exposed to an Aviation Warfare Company officer. However, actual data will be presented in the next section, which indicates that not all warfare community selectees are most likely to be exposed to Aviation Warfare Company Officers.

### *b. The actual distribution Chi-Squared table*

The data included in Table 24 represent the actual percentage of midshipmen that service selected a given warfare community and were most exposed to Company Officers of each warfare specialty. Again, all female cases and "split" exposed cases were filtered from the data set before a frequency count analysis was conducted. The number of midshipmen that service selected each warfare community and were most exposed to Company Officers of each warfare community were divided by the total number of cases and entered into Table 24.

Table 24. Actual Service Selection Chi-Squared Distribution

**Actual: Distribution within Brigade**

| | | EXPOSED | | | | |
|---|---|---|---|---|---|---|
| | | SWO | Aviator | Submariner | USMC | SEAL |
| SERV_SEL | SWO | 14.89% | 9.06% | 5.34% | 4.39% | 1.19% |
| | Aviator | 8.71% | 15.70% | 4.57% | 4.25% | 0.74% |
| | Submariner | 3.58% | 3.37% | 3.55% | 1.30% | 0.28% |
| | USMC | 4.14% | 5.06% | 2.53% | 5.66% | 0.32% |
| | SEAL | 0.39% | 0.46% | 0.21% | 0.21% | 0.11% |

The actual SERV_SEL vs. EXPOSED distribution looks quite different from the expected SERV_SEL vs. EXPOSED distribution presented in Table 23. Unlike Table 23 where the highest percentages were presented consistently in the "Aviator" column, the highest percentages in each row and column in Table 24 are often when the row and column heading are the same. For example, for all midshipmen that eventually service selected USMC, 5.66% were most exposed to USMC Company Officers, a higher percentage than was exposed to any other warfare community.

### *c. The Chi-Squared analysis of service selection distribution*

The $\chi^2$ analysis was conducted by using the values in Table 23 and Table 24 in the $\chi^2$ formula (Equation 1). The $\chi^2$ analysis yielded an output of 283.8439 which was much greater than the critical values of 26.2962 and 31.9999, for a .05 and .01 level of significance, respectively. Because the $\chi^2$ value is larger than the critical values for

.05 and .01, signifying that there is a 99% probability that the variables are not independent of one another, the null hypothesis should be rejected.

The fact that the $\chi^2$ analysis yielded a dependent relationship between EXPOSED and SERV_SEL is a significant finding itself. Exposure of warfare qualified Company Officers alone significantly influences midshipmen to service select the same warfare community as their Company Officer. The midshipmen are obviously attracted to the warfare community they have become familiar with through their Company Officer and more likely to desire a commissioning into the same community.

## D. LOGIT REGRESSION MODELS

In an attempt to model the propensity of a midshipman to service select a particular warfare community; a logistic regression model was used. Logistic regression models are used to predict the outcome of a discrete dependent variable and provide flexibility in the type of independent variables that can be used as predictors. The independent variables can be discrete, continuous, dichotomous or a mix of any or all of the three.

The discrete dependent variables used in the logistic regressions were binary variables that indicated whether a midshipman chose a particular warfare community or not. These dependent variables included: SWO_SLCT, AVI_SLCT, SUB_SLCT, USMC_SEL, and SEAL_SEL. The logistic regression model uses the following equation (Equation 2) to estimate the probability of a particular discrete outcome:

$$P_i = e^u/(1+e^u) = 1/(1+e^{-u}) \qquad \text{(Equation 2)}$$

$P_i$ is the probability that the *i*th case is one of the particular discrete outcomes, e is the base of the natural logarithm and *u* is the estimated logit model:

$$\ln(P/1-P) = A + B_1X_1 + B_2X_2 + B_3X_3 + \ldots \qquad \text{(Equation 3)}$$

The value *A* represents the constant, $B_i$ the estimated coefficients, and $X_i$ the predictors. The model is estimated using maximum likelihood techniques. The independent variables initially analyzed to predict the probability of service selecting a particular community were: SWO_EXP, AVIA_EXP, SUB_EXP, USMC_EXP,

SEAL_EXP, CUM_AQPR, CUM MQPR, MC_FAM, NAVY_FAM, MIL_BACK, GENDER, and GROUP. These variables were included in the analysis based on the material in the literature review or were included in an effort to control for other influences (e.g., Group 3 midshipmen are less likely to be chosen to attend a Nuclear Power interview, therefore, are less likely to service select Submarine Warfare; Gender was included because women are unable to service select Special Warfare or Submarine Warfare due to combat restrictions/habitability issues). Those variables that were found to be statistically insignificant (p-value >.05) to a particular dependent variable were removed and the logit model re-estimated. The independent variables that were statistically insignificant when the logit model was conducted also provided insightful findings.

### 1. SWO_SLCT logistic regression model

The SWO_SLCT dependent variable represented a binary variable identifying those midshipmen who selected Surface Warfare equal to one and those midshipmen choosing other warfare communities equal to zero. The variables expected to be significant (<.05), insignificant (>.05) and their positive or negative relationship to SWO_SLCT are listed below:

Table 25. SWO_SLCT: Independent Variables

| EXPECTED VARIABLE SIGNIFICANCE AND SIGN | | |
|---|---|---|
| | | |
| **VARIABLE** | **+ / -** | **SIGNIFICANT?** |
| SWO_EXP | + | Significant |
| AVIA_EXP | - | Significant |
| SUB_EXP | - | Significant |
| USMC_EXP | - | Significant |
| SEAL_EXP | - | Significant |
| CUM_AQPR | ? | Insignificant |
| CUM_MQPR | ? | Insignificant |
| MC_FAM | - | Significant |
| NAVY_FAM | + | Significant |
| MIL_BACK | ? | Insignificant |
| GENDER | + | Significant |
| GROUP | ? | Insignificant |

The initial logit model yielded output that is shown in Appendix B. Variables that were not statistically significant (SEAL_EXP, NAVY_FAM and GROUP) were removed, and a second logit model was estimated. The final model results are shown in Appendix B and are summarized in Table 26:

Table 26. Results of SWO_SLCT logit model

| VARIABLE | EXPECTED + / - | *B* COEFFICIENT (STANDARD ERROR) | SIGNIFICANCE | P-Value |
|---|---|---|---|---|
| SWO_EXP | + | +0.251 (0.120) | Significant | 0.037 |
| AVIA_EXP | - | -0.578 (0.124) | Significant | 0.000 |
| SUB_EXP | - | -0.307 (0.144) | Significant | 0.033 |
| USMC_EXP | - | -0.630 (0.148) | Significant | 0.000 |
| SEAL_EXP | - | N/A | Insignificant | 0.346 |
| CUM_AQPR | ? | -0.688 (0.116) | Significant | 0.000 |
| CUM_MQPR | ? | -1.530 (0.173) | Significant | 0.000 |
| MC_FAM | - | -0.670 (0.165) | Significant | 0.000 |
| NAVY_FAM | + | N/A | Insignificant | 0.146 |
| MIL_BACK | ? | -0.299 (0.105) | Significant | 0.005 |
| GENDER | + | +1.203 (0.117) | Significant | 0.000 |
| GROUP | ? | N/A | Insignificant | 0.207 |
| Chi-Squared = 540.712 | | | -2 Log likelihood = 3738.593 | |

### *a. Influence of Company Officer on service selection*

The findings from this logistic regression support the hypothesis that midshipmen who are most exposed to Company Officers from the Surface Warfare community are more likely to be attracted to and service select the Surface Warfare community than are midshipmen who were most exposed to Company Officers from other warfare communities.

Additionally, the SWO_SLCT model also supports the material cited in the literature review portion of this study because young people are drawn to what they are familiar with, and conversely are hesitant of the warfare communities they are unfamiliar with. In this case, by being most familiar with another warfare community, midshipmen are less likely to choose to become a Surface Warfare Officer.

### *b. Effect of Control variables on service selection*

Besides being influenced by exposure to Company Officers, midshipmen service selection desires to select other warfare communities can be controlled for by including other influential variables in the logistic regression. Midshipmen with Marine Corps history in their immediate family (i.e., familiar with the Marine Corps) were less likely (*B* = -0.670) to become Surface Warfare Officers than midshipmen without Marine Corps history in their family. Additionally, being a female midshipman had a positive relationship with becoming a Surface Warfare Officer (coefficient for GENDER = +1.203). The *B* coefficient for GENDER was larger (had more impact on whether a midshipmen selected Surface Warfare) than any other variable in this analysis. This can be explained by the fact that physically qualified females are required to service select from three of the five communities analyzed for in this study (SWO, Aviation, USMC), and a majority of the females in this study service selected Surface Warfare. Table 27 shows the service selection distribution of female graduates in the dataset.

Table 27. Female Service Selection Distribution Year Groups 1994/1995/1996/2001

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Surfare Warfare | 239 | 59.0 | 59.0 | 59.0 |
| | 1 Aviation Warfare | 95 | 23.5 | 23.5 | 82.5 |
| | 3 USMC | 71 | 17.5 | 17.5 | 100.0 |
| | Total | 405 | 100.0 | 100.0 | |

Another aspect of the SWO_SLCT regression that was interesting was the fact that CUM_AQPR and CUM_MQPR both had negative *B* values and were significant variables. This can be attributed to the fact that Surface Warfare has become the warfare community for some midshipmen who are not qualified or academically competitive for other warfare community billets. The Surface Warfare community also has an unlimited number of billets each year, unlike many other communities. Consequently, when other communities billets are filled, the remaining midshipmen are more likely to become Surface Warfare Officers. The following figures are histograms of the midshipmen OOMs in the entire data set and a histogram of the OOMs of those midshipmen who service selected Surface Warfare.

Figure 1. OOM distribution for entire data set

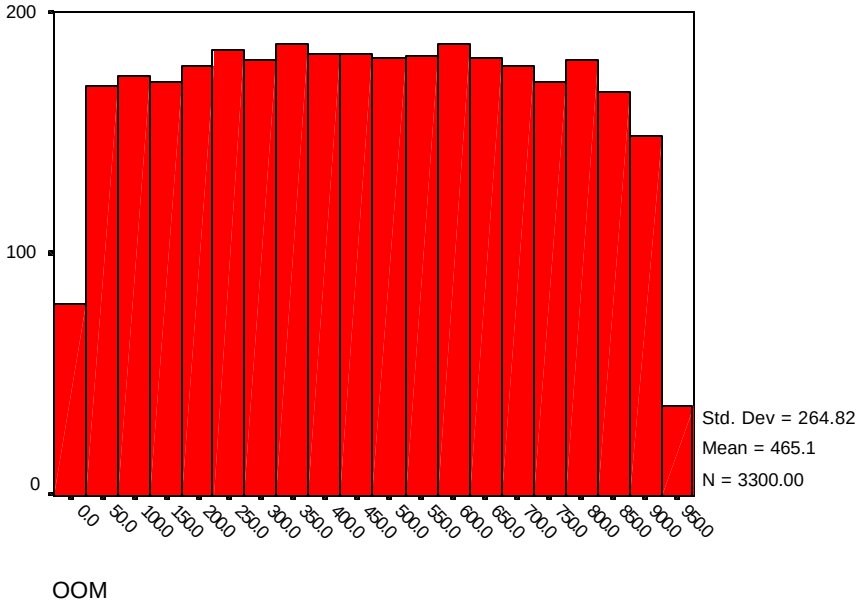
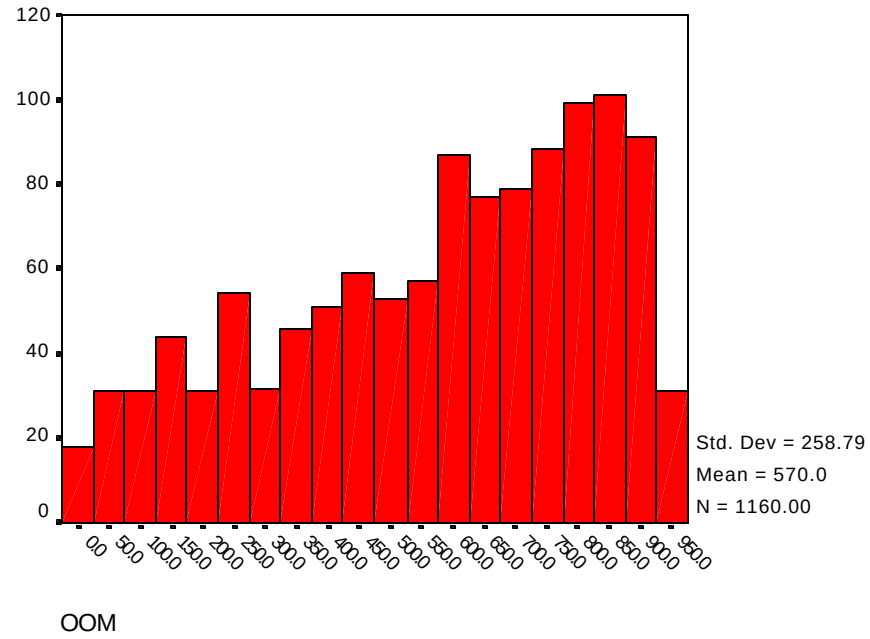



Figure 2. OOM distribution for Surface Warfare selectees




Because of the large number of midshipmen in the lower third (midshipmen with the highest OOM) who service select Surface Warfare, the CUM_AQPR and CUM_MQPR variables are going to be skewed toward the lower end of the zero to four scale, and will tend to have a negative relationship with SWO_SLCT in the logit model.

### 2. AVI_SLCT logistic regression model

The AVI_SLCT dependent variable represented a binary variable identifying those midshipmen who selected Aviation Warfare equal to one and those midshipmen choosing other warfare communities equal to zero. The variables expected to be significant and their positive or negative relationship to AVI_SLCT are listed below:

Table 28. AVI_SLCT: Independent Variables

| EXPECTED VARIABLE SIGNIFICANCE AND SIGN | | |
|---|---|---|
| | | |
| **VARIABLE** | **+ / -** | **SIGNIFICANT?** |
| SWO_EXP | - | Significant |
| AVIA_EXP | + | Significant |
| SUB_EXP | - | Significant |
| USMC_EXP | - | Significant |
| SEAL_EXP | - | Significant |
| CUM_AQPR | ? | Insignificant |
| CUM_MQPR | ? | Insignificant |
| MC_FAM | - | Significant |
| NAVY_FAM | + | Significant |
| MIL_BACK | ? | Insignificant |
| GENDER | + | Insignificant |
| GROUP | ? | Insignificant |

The initial logistic regression yielded output that is shown in Appendix B. Variables that were not statistically significant (SEAL_EXP, NAVY_FAM, GROUP, MIL_BACK, SUB_EXP, SWO_EXP, and USMC_EXP) were removed from the regression, and a second logistic regression was estimated. The final model results are shown in Appendix B and are summarized in Table 29.

Table 29. Results of AVI_SLCT logit model

| VARIABLE | EXPECTED + / - | *B* COEFFICIENT (STANDARD ERROR) | SIGNIFICANCE | P-Value |
|---|---|---|---|---|
| SWO_EXP | - | N/A | Insignificant | 0.801 |
| AVIA_EXP | + | +0.801 (0.081) | Significant | 0.000 |
| SUB_EXP | - | N/A | Insignificant | 0.997 |
| USMC_EXP | - | N/A | Insignificant | 0.975 |
| SEAL_EXP | - | N/A | Insignificant | 0.927 |
| CUM_AQPR | ? | +0.420 (0.110) | Significant | 0.000 |
| CUM_MQPR | ? | +0.676 (0.171) | Significant | 0.000 |
| MC_FAM | - | -0.452 (0.159) | Significant | 0.005 |
| NAVY_FAM | + | N/A | Insignificant | 0.735 |
| MIL_BACK | ? | N/A | Insignificant | 0.192 |
| GENDER | + | -0.508 (0.127) | Significant | 0.000 |
| GROUP | ? | N/A | Insignificant | 0.865 |
| Chi-Squared = 225.909 | | | -2 Log likelihood = 3969.518 | |

### *a. Influence of Company Officer on service selection*

The statistically significant variables in the AVI_SLCT regression were quite different from the statistically significant variables in the SWO_SLCT regression. Unlike the SWO_SLCT regression output, the only warfare community exposure that was significant in influencing midshipmen service selection was AVIA_EXP. The other warfare exposure variables (SWO_EXP, SUB_EXP, USMC_EXP, and SEAL_EXP) were statistically insignificant in predicting whether midshipmen would become Aviation Warfare Officers upon graduation. However, those Company Officers who were aviators had a significant positive influence on the midshipmen to service select Aviation Warfare.

### *b. Effect of Control variables on service selection*

Much like the SWO_SLCT regression model, those midshipmen with Marine Corps experience in the immediate family are less likely to service select Aviation Warfare. These findings are in agreement with the literature on vocational choice behavior in that midshipmen are drawn to that vocation they are familiar with. By growing up and living in a household with parents who are past or present members of the Marine Corps influences these young people and impacts their desire not to service select other warfare communities. The consistency of the influence of this variable will be seen throughout this study.

The variable GENDER was also significant in predicting whether midshipmen would become Aviation Warfare Officers. However, the expected *B* coefficient sign was opposite of the actual B coefficient. Because women are able to service select three of the five warfare communities examined in this study, the GENDER variable was expected to have a positive relationship with midshipmen becoming naval aviators. The final logistic regression resulted in a *B* coefficient of -.508 for the GENDER variable, and represented the most negative related significant variable in the analysis. Although the females members of this study could only select 3 of the 5 warfare communities, only 23.5% of the females selected Aviation Warfare (see Table 27). Additionally, because of the large number of Aviation Warfare billets available each year, these 95 women only represent 8.7% of the total midshipmen in the study who service selected Aviation Warfare.

### 3. SUB_SLCT logistic regression model

The SUB_SLCT dependent variable represented a binary variable identifying those midshipmen that selected Submarine Warfare equal to one and those midshipmen choosing other warfare communities equal to zero. The variables expected to be significant and their positive or negative relationship to SUB_SLCT are listed below:

Table 30. SUB_SLCT: Independent Variables

| EXPECTED VARIABLE SIGNIFICANCE AND SIGN | | |
|---|---|---|
| | | |
| **VARIABLE** | **+ / -** | **SIGNIFICANT?** |
| SWO_EXP | - | Significant |
| AVIA_EXP | - | Significant |
| SUB_EXP | + | Significant |
| USMC_EXP | - | Significant |
| SEAL_EXP | - | Significant |
| CUM_AQPR | + | Significant |
| CUM_MQPR | ? | Insignificant |
| MC_FAM | - | Significant |
| NAVY_FAM | + | Significant |
| MIL_BACK | ? | Insignificant |
| GENDER | - | Significant |
| GROUP | - | Significant |

Unlike the previous 'Expected Variable Significance and Sign' tables, the variables GROUP and CUM_AQPR were expected to be significant in the SUB_SLCT regression. The expected significance of these variables was based upon the fact that midshipmen interested in Submarine Warfare are required to complete an interview with Naval Reactors. The interested midshipmen are pre-screened prior to receiving an interview, and the academic record is scrutinized. Because of the pre-screening scrutiny their records receive and the interview required prior to selection of the midshipmen into the Submarine community, the variables CUM_AQPR and GROUP were expected to be positively related to the dependent variable SUB_SLCT.

The initial logistic regression trial yielded output that is shown in Appendix B. Variables that were not statistically significant (SEAL_EXP, NAVY_FAM, GENDER, AVI_EXP, and USMC_EXP) were removed from the regression, and an additional logistic regression was completed. The final model results are shown in Appendix B and are summarized in Table 31.

Table 31. Results of SUB_SLCT logit model

| VARIABLE | EXPECTED + / - | *B* COEFFICIENT (STANDARD ERROR) | SIGNIFICANCE | P-Value |
|---|---|---|---|---|
| SWO_EXP | - | +0.288 (0.142) | Significant | 0.042 |
| AVIA_EXP | - | N/A | Insignificant | 0.848 |
| SUB_EXP | + | +1.130 (0.152) | Significant | 0.000 |
| USMC_EXP | - | N/A | Insignificant | 0.843 |
| SEAL_EXP | - | N/A | Insignificant | 0.384 |
| CUM_AQPR | + | +2.617 (0.186) | Significant | 0.000 |
| CUM_MQPR | ? | -1.608 (0.269) | Significant | 0.000 |
| MC_FAM | - | -0.709 (0.299) | Significant | 0.018 |
| NAVY_FAM | + | N/A | Insignificant | 0.624 |
| MIL_BACK | ? | -0.344 (0.154) | Significant | 0.026 |
| GENDER | - | N/A | Insignificant | 0.123 |
| GROUP | - | -0.790 (0.078) | Significant | 0.000 |
| Chi-Squared = 468.793 | | | -2 Log likelihood = 1920.848 | |

### *a. Influence of Company Officer on service selection*

In this regression only two of the warfare community exposure variables, SWO_EXP and SUB_EXP, had statistically significant influence on midshipmen who service selected Submarine Warfare. The exposure to submarine warfare qualified Company Officers (SUB_EXP) was positively related to SUB_SLCT and had a *B* value of +1.130. The midshipmen who were familiar with the submarine community through extensive exposure were subsequently attracted to that the community as was significantly evident in the logistic regression output.

The only other warfare community that significantly influenced midshipmen when faced with the decision to become submariners was the Surface Warfare community. Although the relationship between SWO_EXP and SUB_SLCT (*B* = +0.288) was not as strong as the relationship between SUB_EXP and SUB_SLCT (*B* =

+1.130), midshipmen who were most exposed to Surface Warfare Officers were more likely to choose to become submarine officers than not. All other warfare community (AVIA_EXP, USMC_EXP, SEAL_EXP) exposure was shown to be statistically insignificant in influencing midshipmen decisions concerning Submarine Warfare.

***b. Effect of Control variables on service selection***

Of the seven non-Company Officer exposure variables in the initial logistic regression analysis, five of the independent variables were statistically significant in the final regression model (CUM_AQPR, CUM_MQPR, GROUP, MC_FAM and MIL_BACK). The independent variables CUM_AQPR and GROUP were related to the dependent variable as expected due to the strict academic standards required of midshipmen desiring an interview with the Director of Naval Nuclear Power, and Naval Reactors propensity to select midshipmen with strong engineering backgrounds (i.e. midshipmen in group 1 majors). Table 32 shows the major distribution of Submarine Warfare selectees in the study.

Table 32. Major group distribution of Submarine Warfare selectees

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 252 | 64.9 | 64.9 | 64.9 |
| | 2 | 81 | 20.9 | 20.9 | 85.8 |
| | 3 | 55 | 14.2 | 14.2 | 100.0 |
| | Total | 388 | 100.0 | 100.0 | |

In addition to the significance of the GROUP variable, the CUM_AQPR variable had the largest *B* coefficient of all the statistically significant variables (*B* = +2.617). The midshipmen who service select Submarine Warfare are thoroughly screened academically prior to service selection and their mean academic grade point average is significantly higher than the midshipmen who service select other warfare communities.

Figure 3. CUM_AQPR distribution of Submarine Warfare selectees

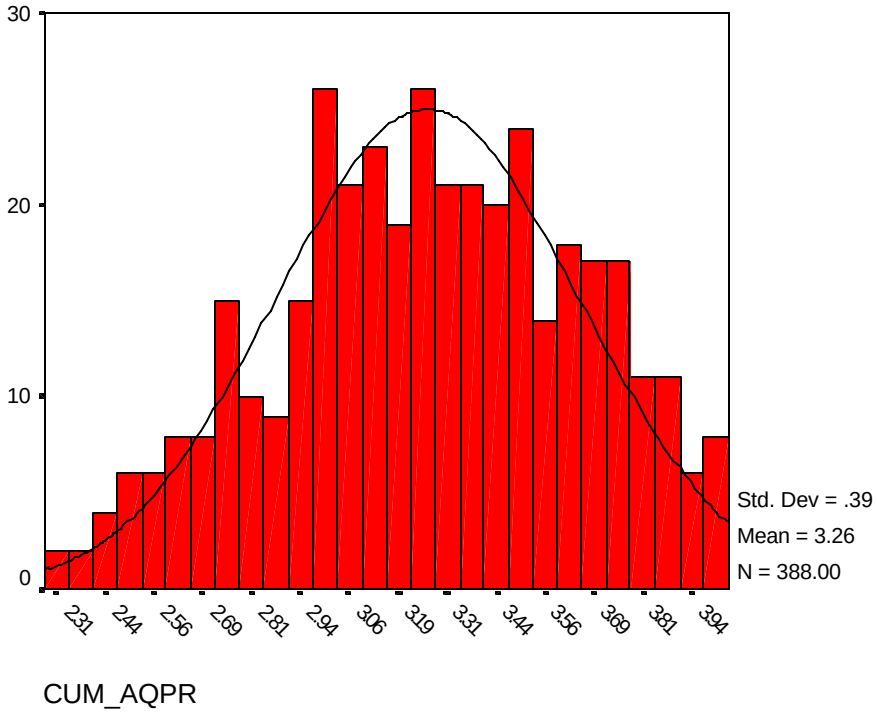
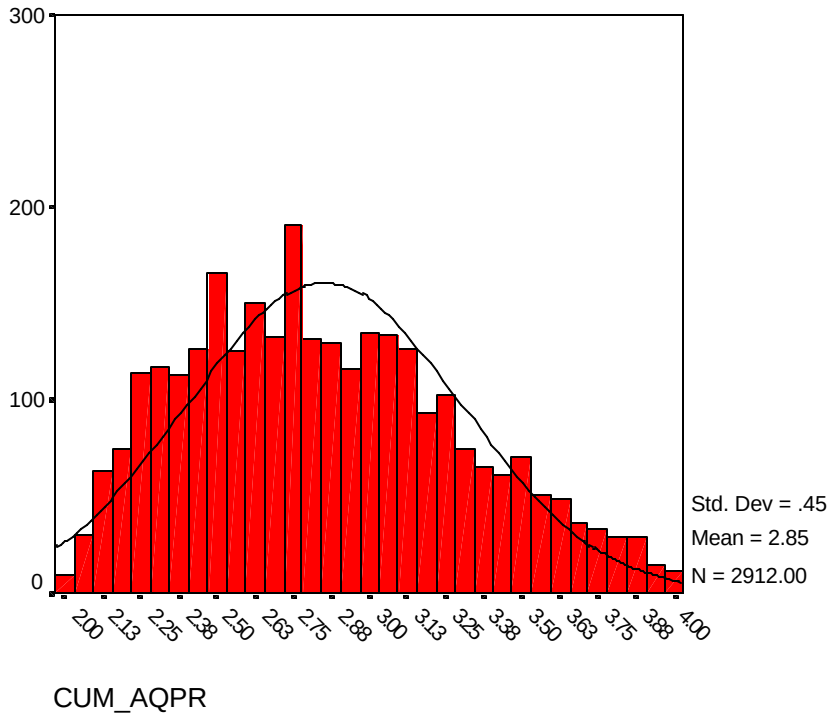



Figure 4. CUM_AQPR distribution of non-Submarine Warfare selectees



The presence of USMC experience in the immediate family is negatively related to a midshipman choosing to receive a commission into the submarine community. This outcome was predictable due to the preexistent familiarity with and attraction to the Marine Corps influencing the midshipmen and making them less likely to service select other warfare communities. Of the 243 midshipmen with personal prior Marine Corps experience or Marine Corps experience in their immediate family, only 14 (5.8%) of these midshipmen service selected Submarine Warfare.

The independent variable MIL_BACK was also significant ($B$ = -0.344) in the SUB_SLCT regression analysis. Those midshipmen with non-naval service background in their immediate family were less likely to service select Submarine Warfare than those midshipmen with naval service background or no military background in their family. The MIL_BACK independent variable was not statistically significant in any other logistic regression except in the SUB_SLCT logistic regression analysis.

### 4. USMC_SEL logistic regression model

The USMC_SEL dependent variable represented a binary variable identifying those midshipmen that selected the Marine Corps equal to one and those midshipmen choosing other warfare communities equal to zero. The variables expected to be significant and their positive or negative relationship to USMC_SEL are listed below:

Table 33. USMC_SEL: Independent Variables

| EXPECTED VARIABLE SIGNIFICANCE AND SIGN | | |
|---|---|---|
| | | |
| **VARIABLE** | **+ / -** | **SIGNIFICANT?** |
| SWO_EXP | - | Significant |
| AVIA_EXP | - | Significant |
| SUB_EXP | - | Significant |
| USMC_EXP | + | Significant |
| SEAL_EXP | - | Significant |
| CUM_AQPR | ? | Insignificant |
| CUM_MQPR | ? | Insignificant |
| MC_FAM | + | Significant |
| NAVY_FAM | - | Significant |
| MIL_BACK | ? | Insignificant |
| GENDER | ? | Insignificant |
| GROUP | ? | Insignificant |

The initial logistic regression trial yielded output that is shown in Appendix B Variables that were not statistically significant (SEAL_EXP, MIL_BACK, SUB_EXP, AVIA_EXP, and GENDER) were removed from the regression, and an additional logistic regression was completed. The final model results are shown in Appendix B and are summarized in Table 34.

Table 34. Results of USMC_SEL logit model

| VARIABLE | EXPECTED + / - | *B* COEFFICIENT (STANDARD ERROR) | SIGNIFICANCE | P-Value |
|---|---|---|---|---|
| SWO_EXP | - | -0.281 (0.121) | Significant | 0.021 |
| AVIA_EXP | - | N/A | Insignificant | 0.153 |
| SUB_EXP | - | N/A | Insignificant | 0.138 |
| USMC_EXP | + | +1.050 (0.123) | Significant | 0.000 |
| SEAL_EXP | - | N/A | Insignificant | 0.106 |
| CUM_AQPR | ? | -1.580 (0.149) | Significant | 0.000 |
| CUM_MQPR | ? | +1.918 (0.223) | Significant | 0.000 |
| MC_FAM | + | +1.266 (0.149) | Significant | 0.000 |
| NAVY_FAM | - | -0.344 (0.109) | Significant | 0.002 |
| MIL_BACK | ? | N/A | Insignificant | 0.116 |
| GENDER | ? | N/A | Insignificant | 0.705 |
| GROUP | ? | +0.335 (0.057) | Significant | 0.000 |
| Chi-Squared = 354.017 | | | -2 Log likelihood = 2760.211 | |

### *a. Influence of Company Officer on service selection*

In the USMC_SEL logistic regression only two of the Company Officer exposure variables were statistically significant in predicting whether midshipmen would select Marine Corps or not. The Company Officer variables that were statistically significant were USMC_EXP and SWO_EXP.

As expected the USMC_EXP variable was statistically significant and positively related to the dependent variable, USMC_SEL. The midshipmen that are most exposed to Marine Corps Company Officers at the Naval Academy are more likely to

select to be commissioned into the Marine Corps than any other community (see Table 35). Midshipmen who are most exposed to Marine Corps Company Officers choose to be commissioned into the Marine Corps 35.8% of time, a higher percentage than any other warfare community. Table 35 shows the warfare community chosen by those midshipmen who were most exposed to Marine Corps Company Officers.

Table 35. Service selection distribution of midshipmen most exposed to Marine Corps Company Officers

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Surfare Warfare | 125 | 27.8 | 27.8 | 27.8 |
| | 1 Aviation Warfare | 121 | 26.9 | 26.9 | 54.7 |
| | 2 Submarine Warfare | 37 | 8.2 | 8.2 | 62.9 |
| | 3 USMC | 161 | 35.8 | 35.8 | 98.7 |
| | 4 Special Warfare | 6 | 1.3 | 1.3 | 100.0 |
| | Total | 450 | 100.0 | 100.0 | |

Although all the other Company Officer exposure variables were negatively related to USMC_SEL, the other statistically significant independent variable in the logistic regression was SWO_EXP. The midshipmen most exposed to Company Officers who were qualified Surface Warfare Officers were less likely ($B$ = -0.281) to become Marines upon graduation than midshipmen who were most exposed to Company Officers from different warfare communities.

***b. Effect of Control variables on service selection***

The non-Company Officer exposure independent variables that were statistically significant in the USMC_SEL regression were GROUP, MC_FAM, NAVY_FAM, CUM_AQPR and CUM_MQPR. The variables GROUP, CUM_AQPR and CUM_MQPR were specifically used as control variables in other logistic regressions, but the output from the USMC_SEL regression provided interesting findings concerning those midshipmen that service select Marine Corps. In general, the midshipmen who become Marines are more likely to be group 3 majors (humanities and social sciences), have lower academic grade point averages (mean CUM_AQPR of 2.77/4.0 versus 2.93/4.0), and higher military grade point averages than non-Marine Corps selectees.

The MC_FAM and NAVY_FAM variables provide support for the hypothesis that midshipmen are drawn to what they are familiar with. The MC_FAM variable had as large a *B* coefficient (*B* = +1.266) as USMC_EXP (B = +1.050), and is obviously a strong influence on midshipmen service selecting Marine Corps. This familiarity with the Marine Corps, and consequently attraction to becoming a Marine, support Zajonc's 'mere exposure' hypothesis. The midshipmen that were coded as a 1 in the USMC_FAM variable (having Marine Corps experience in the immediate family) chose to become Marines 44.0% of the time upon graduation, whereas the midshipmen who were coded a 0 (no Marine Corps experience in immediate family) chose to become Marines only 16.0% of the time.

Additionally, the exposure to the Navy by family members or personal prior service in the Navy is negatively related (B = -0.344) to becoming a Marine upon commissioning. This prior Navy exposure is likely to lead to an aversion to the Marine Corps and the midshipmen are less likely to service select Marine Corps (15.0%) than midshipmen with no Navy experience in the immediate family (19.5%).

**5. SEAL_SEL logistic regression model**

The SEAL_SEL dependent variable represented a binary variable identifying those midshipmen that selected Special Warfare equal to one and those midshipmen choosing other warfare communities equal to zero. The variables expected to be significant and their positive or negative relationship to SEAL_SEL are listed below:

Table 36. SEAL_SEL: Independent Variables

| EXPECTED VARIABLE SIGNIFICANCE AND SIGN | | |
|---|---|---|
| | | |
| **VARIABLE** | **+ / -** | **SIGNIFICANT?** |
| SWO_EXP | - | Significant |
| AVIA_EXP | - | Significant |
| SUB_EXP | - | Significant |
| USMC_EXP | - | Significant |
| SEAL_EXP | + | Significant |
| CUM_AQPR | ? | Insignificant |
| CUM_MQPR | ? | Insignificant |
| MC_FAM | - | Significant |
| NAVY_FAM | + | Significant |
| MIL_BACK | ? | Insignificant |
| GENDER | - | Significant |
| GROUP | ? | Insignificant |

The initial logistic regression trial yielded output that is shown in Appendix B. Variables that were not statistically significant (SEAL_EXP, MIL_BACK, NAVY_FAM, MC_FAM, GROUP, and GENDER) were removed from the regression, and an additional logistic regression was completed. The final model results are shown in Appendix B and are summarized in Table 37.

Table 37. Results of SEAL_SEL logit model

| VARIABLE | EXPECTED + / - | *B* COEFFICIENT (STANDARD ERROR) | SIGNIFICANCE | P-Value |
|---|---|---|---|---|
| SWO_EXP | - | -1.171 (0.371) | Significant | 0.002 |
| AVIA_EXP | - | -1.294 (0.351) | Significant | 0.000 |
| SUB_EXP | - | -1.304 (0.464) | Significant | 0.005 |
| USMC_EXP | - | -1.197 (0.464) | Significant | 0.010 |
| SEAL_EXP | + | N/A | Insignificant | 0.904 |
| CUM_AQPR | ? | -0.751 (0.381) | Significant | 0.049 |
| CUM_MQPR | ? | +4.354 (0.742) | Significant | 0.000 |
| MC_FAM | - | N/A | Insignificant | 0.117 |
| NAVY_FAM | + | N/A | Insignificant | 0.954 |
| MIL_BACK | ? | N/A | Insignificant | 0.282 |
| GENDER | - | N/A | Insignificant | 0.565 |
| GROUP | ? | N/A | Insignificant | 0.062 |
| Chi-Squared = 73.273 | | | -2 Log likelihood = 534.471 | |

### *a. Influence of Company Officer on service selection*

In the SEAL_SEL regression most of the Company Officer exposure variables were statistically significant, the only variable not being statistically significant being the SEAL_EXP variable. The variables SWO_EXP, AVIA_EXP, SUB_EXP and USMC_EXP were all significant as expected, and had the same *B* coefficient sign as was expected. What is interesting is that although SEAL_EXP is not significant, it is NOT negatively significant. This outcome was partially predictable from the data and tables presented in section IV.B.2 that showed the percentage of midshipmen that service selected each community after being exposed to each community of warfare qualified Company Officers. The male midshipmen who were most exposed to Special Warfare Company Officers were approximately four times more likely to service select Special Warfare than the midshipmen that were most exposed to Company Officers of other warfare communities. These results again support the hypothesis that midshipmen are

attracted to what they are familiar with, and conversely are less likely to feel comfortable with what they have little experience with.

### *b. Effect of Control variables on service selection*

The only non-Company Officer exposure variables that were statistically significant were the academic and military grade point average variables, CUM_AQPR (*B* = -0.751) and CUM_MQPR (*B* = +4.354). The variable CUM_AQPR was in fact borderline significant with a significance coefficient of 0.049 whereas the CUM_MQPR variable had a significance coefficient of 0.000. With such a large B coefficient, the CUM_MQPR was very indicative of a strong relationship with the SEAL_SEL variable.

The midshipmen who service selected Special Warfare had a significantly higher mean military grade point average than the midshipmen who selected other warfare communities. Special Warfare selectees had a mean military grade point average of 3.48, whereas the midshipmen who service selected other warfare communities had a mean military grade point average of 3.22 as seen in figures 5 and 6.

Figure 5. CUM_MQPR for Special Warfare selectees

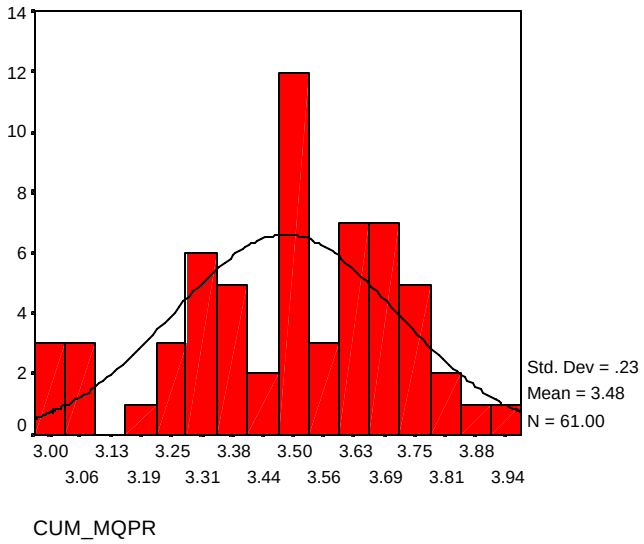
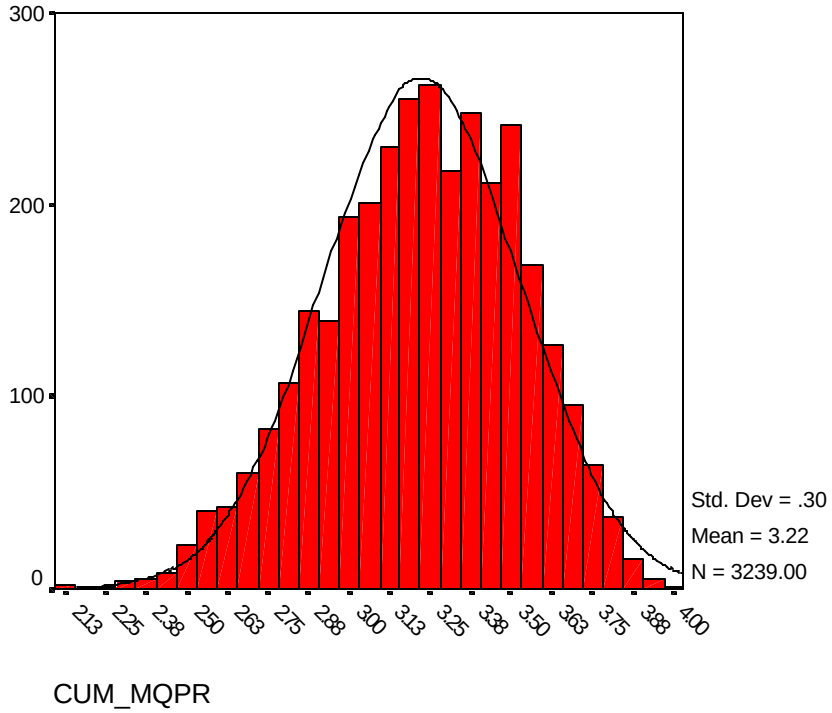


Figure 6. CUM_MQPR for non-Special Warfare selectees




None of the legacy military variables (MC_FAM, NAVY_FAM and MIL_BACK) were statistically significant in this analysis. The SEAL_SEL regression was the only analysis that prior Marine Corps experience in the immediate family did not have a significant influence on service selection warfare community. These results could be the outcome of a small population of Special Warfare selectees, or it could be indicative of a warfare community that is attractive to individuals from all types of backgrounds, and the members are attracted by intangible qualities of the community.

## E. PRE-LEAD VERSUS POST-LEAD IMPACT ON SERVICE SELECTION

Additional statistical analysis was conducted to address the research question: *Do Company Officers who are LEAD program graduates have more, less or the same effect on midshipmen service assignment as non-LEAD program graduates?* The results from the logistic regressions were used in order to explore the impact of the LEAD Program on Company Officer influence upon midshipmen service selection desires.

### 1. Marginal Effect of Company Officer influence

The statistically significant variables from the final logistic regression model for each of the warfare communities were used to conduct a logistic regression of the pre and post-LEAD data sets. These subsequent regressions were used to determine the marginal effect of being exposed to a Company Officer of a particular warfare community. The following table lists provides a summary of the statistically significant variables from the logistic regression for each warfare community.

Table 38. Statistically significant variables

| | **Dependent Variables** | | | | |
|---|---|---|---|---|---|
| **Independent Variables** | SWO_SLCT | AVI_SLCT | SUB_SLCT | USMC_SEL | SEAL_SEL |
| SWO_EXP | X | | X | X | X |
| AVIA_EXP | X | X | | | X |
| SUB_EXP | X | | X | | X |
| USMC_EXP | X | | | X | X |
| SEAL_EXP | | | | | |
| CUM_AQPR | X | X | X | X | X |
| CUM_MQPR | X | X | X | X | X |
| NAVY_FAM | | | | X | |
| MC_FAM | X | X | X | X | |
| MIL_BACK | X | | X | | |
| GROUP | | | X | X | |
| GENDER | X | X | | | |

The marginal effect analysis predicts the percent change of an outcome based on a unit change in one of the independent variables:

$$\text{Marginal Effect} = B * P(Y=1) * P(Y=0)$$

*B* is the logistic coefficient, P(Y=1) is the probability that a given outcome will occur and P(Y=0) is the probability that a given outcome will not occur.

Prior to conducting the marginal effect analysis, the mean values for each of the independent variables for each of the data sets was determined. The mean values for each of the variables are summarized in the following tables:

Table 39. Pre-LEAD independent variable means

| Independent Variables | Mean |
|---|---|
| SWO_EXP | 0.26 |
| AVIA_EXP | 0.30 |
| SUB_EXP | 0.14 |
| USMC_EXP | 0.12 |
| SEAL_EXP | 0.0207 |
| CUM_AQPR | 2.8723 |
| CUM_MQPR | 3.2647 |
| NAVY_FAM | 0.37 |
| MC_FAM | 0.0767 |
| MIL_BACK | 0.19 |
| GROUP | 1.96 |
| GENDER | 0.11 |

Table 40. Post-LEAD independent variable means

| Independent Variables | Mean |
|---|---|
| SWO_EXP | 0.30 |
| AVIA_EXP | 0.27 |
| SUB_EXP | 0.15 |
| USMC_EXP | 0.17 |
| SEAL_EXP | 0.0287 |
| CUM_AQPR | 2.9811 |
| CUM_MQPR | 3.1181 |
| NAVY_FAM | 0.20 |
| MC_FAM | 0.0646 |
| MIL_BACK | 0.18 |
| GROUP | 2.05 |
| GENDER | 0.16 |

The mean values and *B* coefficients were entered into a spreadsheet format and the marginal effects at the means were analyzed. The following pre and post-LEAD results were received:

Table 41. Marginal Effects at the means

| Warfare Community | Pre-LEAD Marginal Effect | Post-LEAD Marginal Effect | Difference (Post-Pre Effect) |
|---|---|---|---|
| Surface | +7.07% | +14.35% | +7.28% |
| Aviation | +19.60% | +10.58% | -9.02% |
| Submarine | +5.34% | +11.93% | +6.59% |
| USMC | +14.58% | +8.99% | -5.59% |
| SEAL | N/A | N/A | N/A |

The percentages presented in Table 41 address the increase in the probability of the "average" midshipman (i.e. all mean variable values are used in predicting/constructing the midshipman) to service select a specific warfare community after being most exposed to Company Officers of that community.

These results imply that if an "average" midshipman is most exposed to pre-LEAD Surface Warfare Company Officers, then he/she has a 7.07% greater chance of service selecting Surface Warfare than not selecting Surface Warfare. However, if the "average" midshipman is most exposed to post-LEAD Surface Warfare Company Officers, then he/she has a 14.35% greater chance of service selecting Surface Warfare than not selecting Surface Warfare.

The probability of service selecting Surface Warfare and Submarine Warfare increases when the midshipman is most exposed to LEAD Program graduate Company Officers of those respective warfare communities versus pre-LEAD Program Company Officers. However, the probability of service selecting Marine Corps or Aviation Warfare decreases when the midshipman is most exposed to LEAD Program graduate Company Officers of those respective warfare communities versus non-LEAD Program graduate Company Officers.

## F. CHAPTER SUMMARY

This chapter has presented statistical evidence addressing the significance of Company Officer exposure on midshipman service selection desires. This chapter was segmented into four major sections, each addressing a separate element of significance linking Company Officer exposure to midshipman service selection.

The first section of this chapter addressed the other than normal service selection distribution within the dataset. This section also presented initial indications that exposure to Company Officers of specific warfare communities may have an impact on the service selection desires of the midshipmen in their company.

The second section of this chapter addressed the Chi-Squared test conducted on the dataset used in this study. The Chi-Squared test indicated that some relationship existed between the warfare community that the midshipmen are most exposed to, and the warfare community in which they chose to be commissioned.

The third section of this chapter dealt with the logistic regressions conducted using five different dependent variables; SWO_SLCT, AVI_SLCT, SUB_SLCT, USMC_SEL and SEAL_SEL. These regressions identified those independent variables that were statistically significant in predicting the outcome of the binary dependent variable.

The final section in this chapter addressed the impact of the LEAD Program in influencing midshipmen service selection desires. A marginal effects analysis was conducted to explore the change in magnitude of influence of LEAD Program graduates versus non-LEAD Program graduates on the propensity of "average" midshipman to service select each warfare community.

# V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

## A. INTRODUCTION

This study was conducted to explore two research questions; (1) *To what extent does exposure to a Company Officer and the warfare specialty of the Company Officer influence midshipmens' service assignment?* (2) *Do Company Officers who are LEAD program graduates have more, less or the same effect on midshipmen service assignment as non-LEAD program graduates?* The conclusions regarding each of these research questions are presented in this chapter. Additionally, recommendations for future research to further explore the influence of Company Officers on midshipmen service selection desires will also be presented.

## B. RESEARCH QUESTION #1 SUMMARY

The findings presented in this study have found that a significant relationship exists between the Company Officer's warfare specialty and midshipmens' service selection desires. The Chi-Squared test generated a value much higher than the 0.01 critical value (for a 16 degree of freedom analysis) and indicated a significant relationship between the variables EXPOSED and SERV_SEL.

The logistic regressions conducted on each service community's dependent variable found that the Company Officer's community was positively related and statistically significant to the service selection of the midshipmen in his/her company. The only warfare community that was not significantly related to the Company Officer's background was Special Warfare. The lack of a significant relationship between SEAL_EXP and SEAL_SEL may be attributable to the small number of midshipmen who are accepted into the community each year and the small number of cases in this study (61 of 3300 midshipmen became SEALs). The table identifying the number and percentage of midshipmen that chose Special Warfare after being most exposed to SEAL Company Officers (Table 19) indicated that even the small number of Special Warfare qualified Company Officers attracted future SEALs at a higher rate than the Company Officers of other warfare communities (5.2% of midshipmen most exposed to Special Warfare Company Officers chose to become SEALs versus an average of 1.5% of the

midshipmen most exposed to other Company Officers). Although the influence of Special Warfare Company Officers is not statistically significant, the exposure to Special Warfare Company Officers does appear to influence future SEAL candidates.

The findings of this study suggest that the number of Company Officers should be balanced in accordance with the number of accessions required of each warfare community each year. For instance, if the number of Marine Corps accessions from USNA is regularly being met, but the number of submariners is below accession requirements, the Naval Academy may want to increase the presence of submarine qualified Company Officers in Bancroft Hall.

## C. RESEARCH QUESTION #2 SUMMARY

The findings of this study imply that the influence of the LEAD Program is not consistent for all warfare communities. The impact of LEAD Program graduates upon midshipman service selection desires appears to be beneficial to recruiting for the Surface Warfare community (+7.28%) and the Submarine community (+6.59%) and detrimental to recruiting for the Marine Corps (-5.59%) and the Aviation community (-9.02%). The Special Warfare community was not included in this analysis because the SEAL_EXP was not statistically significant in predicting SEAL_SEL when a logistic regression of the entire dataset was conducted.

Midshipmen in the class of 2001 were exposed to LEAD Program graduates for a majority of their time at the Naval Academy, but were also exposed to non-LEAD Program graduate Company Officers. Future graduating class at the Naval Academy will be entirely exposed to LEAD Program graduate Company Officers, consequently, future data points are required to further explore the complete impact of the LEAD Program on midshipmen service selection desires.

Whether the LEAD Program is solely responsible for the increase or decrease in the probability of a midshipman service selecting a specific warfare community or not remains to be determined. However, because the marginal effect percentages are positive for all of the community exposure variables that were statistically significant, it is apparent that regardless of whether the Company Officer was a LEAD Program graduate, midshipmen are attracted to the warfare community to which they are most exposed.

## D. RECOMMENDATIONS FOR FURTHER RESEARCH

The researcher of this study recommends that the following additional research be completed to further explore the influence of Company Officer exposure on midshipmen service selection desires:

**1. Investigate whether the Company Officer's influence on service selection desires is greater during any particular stage of a midshipman's time at the Naval Academy.**

This study investigated only two semesters of Company Officers (1st semester and 7th semester) to determine if the particular time period (versus magnitude of exposure) was more influential than another time period. Future research should further investigate the possibility that Company Officers are more influential during a particular stage of a midshipman's time at the Naval Academy.

**2. Investigate the influence of Company Officers on future year groups at the Naval Academy.**

The data warehouse at USNA Institutional Research now accurately tracks company data in a new database system. This system will not require future researchers to "reconstruct" company data using data available from the Performance Office. This system will require fewer assumptions to be made concerning midshipman redistribution throughout the brigade and will account for individual midshipman movement between companies. Although the movement of individual midshipmen appears to have a minimal affect upon the outcome of this study, more accurate research could be completed in the future to validate the findings of this study.

**3. Use of service selection preference data to explore influence of Company Officer exposure.**

This study used actual service selection outcomes to determine the desires of the midshipmen. Current database systems track the actual preferences of midshipmen before service selection is finalized, but archived data were not available for all years in this study. This new system will allow future research to more accurately determine to what extent Company Office exposure actually influences midshipmen service selection desires.

**4. Investigate whether LEAD Program background is solely responsible for the marginal effects found in this study, or whether the change due to some other factor.**

This study's post-LEAD Program data and results were drawn from one year group (2001). After additional classes graduate from the Naval Academy and more data is available for investigation, future research could explore and track the influence of LEAD Program graduates on midshipman service selection.

The changes in the marginal effects for each of the service communities may be driven by another factor (i.e. the number of warfare billets available each year versus the number of Company Officers representing those particular warfare communities) that was not evaluated specifically in this study.

**5. Conduct study of Company Officer exposure influence on midshipman service selection desires, and control for summer cruise experiences.**

Midshipman summer cruises are another influential factor that needs to be taken into account when trying to determine the factors affecting midshipman service selection desires. The researcher of this study found that historical summer cruise information was non-existent or formatted in an inconsistent fashion not easily utilized in a statistical analysis software package. These obstacles prohibited the use of summer cruise data in this analysis; however, future research could potentially build upon the findings of this study and incorporate summer cruise experiences of the midshipmen into the logistical regressions.

# APPENDIX A: FREQUENCY AND DESCRIPTIVE CHARACTERISTICS

Table A.1 Company Realignment

| Original Company | Class of 94 | Class of 95 | Class of 96 |
|---|---|---|---|
| 1 | 34 | 19 | 29 |
| 2 | 26 | 21 | 33 |
| 3 | 22 | 30 | 31 |
| 4 | 27 | 20 | 32 |
| 5 | 36 | 26 | 23 |
| 6 | 24 | 27 | 36 |
| 7 | 33 | 36 | 28 |
| 8 | 31 | 23 | 27 |
| 9 | 19 | 31 | 25 |
| 10 | 28 | 24 | 34 |
| 11 | 21 | 32 | 30 |
| 12 | 25 | 22 | 35 |
| 13 | 23 | 28 | 24 |
| 14 | 32 | 29 | 20 |
| 15 | 30 | 34 | 21 |
| 16 | 35 | 25 | 19 |
| 17 | 20 | 33 | 22 |
| 18 | 29 | 35 | 26 |
| 19 | 9 | 1 | 16 |
| 20 | 17 | 4 | 14 |
| 21 | 11 | 2 | 15 |
| 22 | 3 | 12 | 17 |
| 23 | 13 | 8 | 5 |
| 24 | 6 | 10 | 13 |
| 25 | 12 | 16 | 9 |
| 26 | 2 | 5 | 18 |
| 27 | 4 | 6 | 8 |
| 28 | 10 | 13 | 7 |
| 29 | 18 | 14 | 1 |
| 30 | 15 | 3 | 11 |
| 31 | 8 | 9 | 3 |
| 32 | 14 | 11 | 4 |
| 33 | 7 | 17 | 2 |
| 34 | 1 | 15 | 10 |
| 35 | 16 | 18 | 12 |
| 36 | 5 | 7 | 6 |

Table A.2 Class of 1994: SAME/SAME2/SAME3

**SAME (SERV_SEL = EXPOSED)**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Different | 533 | 62.6 | 62.6 | 62.6 |
| | 1 Same | 319 | 37.4 | 37.4 | 100.0 |
| | Total | 852 | 100.0 | 100.0 | |

**SAME2 (SERV_SEL = FRST_EXP)**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Different | 668 | 78.4 | 78.4 | 78.4 |
| | 1 Same | 184 | 21.6 | 21.6 | 100.0 |
| | Total | 852 | 100.0 | 100.0 | |

**SAME3 (SERV_SEL = LAST_EXP)**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Different | 655 | 76.9 | 76.9 | 76.9 |
| | 1 Same | 197 | 23.1 | 23.1 | 100.0 |
| | Total | 852 | 100.0 | 100.0 | |

Table A.3 Class of 1995: SAME/SAME2/SAME3

**SAME SERV_SEL=EXPOSED**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 545 | 67.4 | 67.4 | 67.4 |
| | 1 | 264 | 32.6 | 32.6 | 100.0 |
| | Total | 809 | 100.0 | 100.0 | |

**SAME2**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 631 | 78.0 | 78.0 | 78.0 |
| | 1 | 178 | 22.0 | 22.0 | 100.0 |
| | Total | 809 | 100.0 | 100.0 | |

**SAME3**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 649 | 80.2 | 80.2 | 80.2 |
| | 1 | 160 | 19.8 | 19.8 | 100.0 |
| | Total | 809 | 100.0 | 100.0 | |

Table A.4 Class of 1996: SAME/SAME2/SAME3

**SAME (SERV_SEL = EXPOSED)**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 507 | 63.1 | 63.1 | 63.1 |
| | 1 | 296 | 36.9 | 36.9 | 100.0 |
| | Total | 803 | 100.0 | 100.0 | |

**SAME2 (SERV_SEL = FRST_EXP)**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 607 | 75.6 | 75.6 | 75.6 |
| | 1 | 196 | 24.4 | 24.4 | 100.0 |
| | Total | 803 | 100.0 | 100.0 | |

**SAME3 (SERV_SEL = LAST_EXP)**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 630 | 78.5 | 78.5 | 78.5 |
| | 1 | 173 | 21.5 | 21.5 | 100.0 |
| | Total | 803 | 100.0 | 100.0 | |

Table A.5 Class of 2001: SAME/SAME2/SAME3

**SAME (SERV_SEL = EXPOSED)**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Different | 580 | 69.4 | 69.4 | 69.4 |
| | 1 Same | 256 | 30.6 | 30.6 | 100.0 |
| | Total | 836 | 100.0 | 100.0 | |

**SAME2 (SERV_SEL = FRST_EXP)**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Different | 629 | 75.2 | 75.2 | 75.2 |
| | 1 Same | 207 | 24.8 | 24.8 | 100.0 |
| | Total | 836 | 100.0 | 100.0 | |

**SAME3 (SERV_SEL = LAST_EXP)**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 Different | 624 | 74.6 | 74.6 | 74.6 |
| | 1 Same | 212 | 25.4 | 25.4 | 100.0 |
| | Total | 836 | 100.0 | 100.0 | |

THIS PAGE INTENTIONALLY LEFT BLANK

# APPENDIX B: LOGISTIC REGRESSION COMPOSITE DATA SET OUTPUT

Table B.1 Initial Surface Warfare (SWO_SLCT) logistic regression output

**Case Processing Summary**

| Unweighted Cases [a] | | N | Percent |
|---|---|---|---|
| Selected Cases | Included in Analysis | 3300 | 100.0 |
| | Missing Cases | 0 | .0 |
| | Total | 3300 | 100.0 |
| Unselected Cases | | 0 | .0 |
| Total | | 3300 | 100.0 |

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 545.230 | 12 | .000 |
| | Block | 545.230 | 12 | .000 |
| | Model | 545.230 | 12 | .000 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 3734.075 | .152 | .210 |

**Classification Table [a]**

| | | | Predicted | | |
|---|---|---|---|---|---|
| | | | SWO Selectees | | Percentage |
| | Observed | | 0 | 1 | Correct |
| Step 1 | SWO Selectees | 0 | 1878 | 262 | 87.8 |
| | | 1 | 681 | 479 | 41.3 |
| | Overall Percentage | | | | 71.4 |

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | SWO_EXP | .287 | .127 | 5.127 | 1 | .024 | 1.332 |
| | AVIA_EXP | -.544 | .131 | 17.344 | 1 | .000 | .581 |
| | SUB_EXP | -.269 | .150 | 3.226 | 1 | .072 | .764 |
| | USMC_EXP | -.590 | .153 | 14.769 | 1 | .000 | .554 |
| | SEAL_EXP | .261 | .276 | .890 | 1 | .346 | 1.298 |
| | CUM_AQPR | -.665 | .116 | 32.662 | 1 | .000 | .514 |
| | CUM_MQPR | -1.511 | .175 | 74.567 | 1 | .000 | .221 |
| | GENDER | 1.195 | .118 | 103.286 | 1 | .000 | 3.303 |
| | GROUP | .059 | .047 | 1.596 | 1 | .207 | 1.061 |
| | MC_FAM | -.649 | .167 | 15.178 | 1 | .000 | .523 |
| | MIL_BACK | -.244 | .112 | 4.735 | 1 | .030 | .784 |
| | NAVY_FAM | .132 | .090 | 2.119 | 1 | .146 | 1.141 |
| | Constant | 6.064 | .495 | 150.032 | 1 | .000 | 430.301 |

Table B.2 Initial Aviation Warfare (AVI_SLCT) logistic regression output

**Case Processing Summary**

| Unweighted Cases[a] | | N | Percent |
|---|---|---|---|
| Selected Cases | Included in Analysis | 3300 | 100.0 |
| | Missing Cases | 0 | .0 |
| | Total | 3300 | 100.0 |
| Unselected Cases | | 0 | .0 |
| Total | | 3300 | 100.0 |

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 228.473 | 12 | .000 |
| | Block | 228.473 | 12 | .000 |
| | Model | 228.473 | 12 | .000 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 3966.953 | .067 | .093 |

**Classification Table [a]**

| | | | Predicted | | |
|---|---|---|---|---|---|
| | | | Aviation Selectees | | Percentage Correct |
| | Observed | | 0 | 1 | |
| Step 1 | Aviation Selectees | 0 | 2045 | 159 | 92.8 |
| | | 1 | 882 | 214 | 19.5 |
| | Overall Percentage | | | | 68.5 |

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | SWO_EXP | .033 | .130 | .064 | 1 | .801 | 1.034 |
| | AVIA_EXP | .813 | .125 | 42.476 | 1 | .000 | 2.256 |
| | SUB_EXP | -.001 | .149 | .000 | 1 | .997 | .999 |
| | USMC_EXP | -.005 | .151 | .001 | 1 | .975 | .995 |
| | SEAL_EXP | .026 | .283 | .008 | 1 | .927 | 1.026 |
| | CUM_AQPR | .409 | .111 | 13.702 | 1 | .000 | 1.506 |
| | CUM_MQPR | .679 | .173 | 15.328 | 1 | .000 | 1.972 |
| | GENDER | -.519 | .127 | 16.623 | 1 | .000 | .595 |
| | GROUP | .008 | .045 | .029 | 1 | .865 | 1.008 |
| | MC_FAM | -.429 | .163 | 6.959 | 1 | .008 | .651 |
| | MIL_BACK | .134 | .103 | 1.706 | 1 | .192 | 1.144 |
| | NAVY_FAM | -.030 | .089 | .114 | 1 | .735 | .970 |
| | Constant | -4.309 | .482 | 79.991 | 1 | .000 | .013 |

Table B.3 Initial Submarine Warfare (SUB_SLCT) logistic regression output

**Case Processing Summary**

| Unweighted Cases[a] | | N | Percent |
|---|---|---|---|
| Selected Cases | Included in Analysis | 3300 | 100.0 |
| | Missing Cases | 0 | .0 |
| | Total | 3300 | 100.0 |
| Unselected Cases | | 0 | .0 |
| Total | | 3300 | 100.0 |

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 560.771 | 12 | .000 |
| | Block | 560.771 | 12 | .000 |
| | Model | 560.771 | 12 | .000 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 1828.870 | .156 | .303 |

**Classification Table [a]**

| | | | Predicted | | |
|---|---|---|---|---|---|
| | | | Submarine Selectees | | Percentage Correct |
| | Observed | | 0 | 1 | |
| Step 1 | Submarine Selectees | 0 | 2869 | 43 | 98.5 |
| | | 1 | 330 | 58 | 14.9 |
| | Overall Percentage | | | | 88.7 |

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | SWO_EXP | .381 | .209 | 3.308 | 1 | .069 | 1.464 |
| | AVIA_EXP | .040 | .209 | .036 | 1 | .848 | 1.041 |
| | SUB_EXP | 1.152 | .217 | 28.136 | 1 | .000 | 3.163 |
| | USMC_EXP | .050 | .254 | .039 | 1 | .843 | 1.052 |
| | SEAL_EXP | .390 | .449 | .756 | 1 | .384 | 1.477 |
| | CUM_AQPR | 2.654 | .189 | 197.011 | 1 | .000 | 14.212 |
| | CUM_MQPR | -1.638 | .273 | 36.120 | 1 | .000 | .194 |
| | GENDER | -7.097 | 4.596 | 2.385 | 1 | .123 | .001 |
| | GROUP | -.742 | .079 | 87.790 | 1 | .000 | .476 |
| | MC_FAM | -.697 | .305 | 5.227 | 1 | .022 | .498 |
| | MIL_BACK | -.322 | .167 | 3.737 | 1 | .053 | .725 |
| | NAVY_FAM | .068 | .139 | .240 | 1 | .624 | 1.070 |
| | Constant | -3.584 | .732 | 23.954 | 1 | .000 | .028 |

Table B.4 Initial USMC (USMC_SEL) logistic regression output

**Case Processing Summary**

| Unweighted Cases[a] | | N | Percent |
|---|---|---|---|
| Selected Cases | Included in Analysis | 3300 | 100.0 |
| | Missing Cases | 0 | .0 |
| | Total | 3300 | 100.0 |
| Unselected Cases | | 0 | .0 |
| Total | | 3300 | 100.0 |

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 362.828 | 12 | .000 |
| | Block | 362.828 | 12 | .000 |
| | Model | 362.828 | 12 | .000 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 2751.399 | .104 | .170 |

**Classification Table [a]**

| | | | Predicted | | |
|---|---|---|---|---|---|
| | | | Marine Corps Selectees | | Percentage Correct |
| | Observed | | 0 | 1 | |
| Step 1 | Marine Corps Selectees | 0 | 2658 | 47 | 98.3 |
| | | 1 | 503 | 92 | 15.5 |
| | Overall Percentage | | | | 83.3 |

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | SWO_EXP | -.527 | .161 | 10.716 | 1 | .001 | .590 |
| | AVIA_EXP | -.349 | .155 | 5.046 | 1 | .025 | .705 |
| | SUB_EXP | -.270 | .182 | 2.201 | 1 | .138 | .764 |
| | USMC_EXP | .802 | .162 | 24.412 | 1 | .000 | 2.230 |
| | SEAL_EXP | -.626 | .387 | 2.615 | 1 | .106 | .535 |
| | CUM_AQPR | -1.574 | .150 | 110.812 | 1 | .000 | .207 |
| | CUM_MQPR | 1.898 | .224 | 71.612 | 1 | .000 | 6.673 |
| | GENDER | -.056 | .149 | .144 | 1 | .705 | .945 |
| | GROUP | .337 | .057 | 34.485 | 1 | .000 | 1.401 |
| | MC_FAM | 1.324 | .153 | 74.627 | 1 | .000 | 3.760 |
| | MIL_BACK | .205 | .130 | 2.476 | 1 | .116 | 1.227 |
| | NAVY_FAM | -.285 | .116 | 6.019 | 1 | .014 | .752 |
| | Constant | -3.815 | .610 | 39.135 | 1 | .000 | .022 |

Table B.5 Initial Special Warfare (SEAL_SEL) logistic regression output

**Case Processing Summary**

| Unweighted Cases [a] | | N | Percent |
|---|---|---|---|
| Selected Cases | Included in Analysis | 3300 | 100.0 |
| | Missing Cases | 0 | .0 |
| | Total | 3300 | 100.0 |
| Unselected Cases | | 0 | .0 |
| Total | | 3300 | 100.0 |

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 96.876 | 12 | .000 |
| | Block | 96.876 | 12 | .000 |
| | Model | 96.876 | 12 | .000 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 510.867 | .029 | .172 |

**Classification Table [a]**

| | | | Predicted | | |
|---|---|---|---|---|---|
| | | | Special Warfare Selectees | | Percentage Correct |
| | Observed | | 0 | 1 | |
| Step 1 | Special Warfare Selectees | 0 | 3239 | 0 | 100.0 |
| | | 1 | 61 | 0 | .0 |
| | Overall Percentage | | | | 98.2 |

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | SWO_EXP | -1.141 | .382 | 8.927 | 1 | .003 | .319 |
| | AVIA_EXP | -1.319 | .362 | 13.302 | 1 | .000 | .267 |
| | SUB_EXP | -1.316 | .473 | 7.740 | 1 | .005 | .268 |
| | USMC_EXP | -1.188 | .476 | 6.229 | 1 | .013 | .305 |
| | SEAL_EXP | -.079 | .652 | .015 | 1 | .904 | .924 |
| | CUM_AQPR | -.779 | .391 | 3.979 | 1 | .046 | .459 |
| | CUM_MQPR | 4.492 | .759 | 35.023 | 1 | .000 | 89.300 |
| | GENDER | -7.160 | 12.438 | .331 | 1 | .565 | .001 |
| | GROUP | .284 | .152 | 3.472 | 1 | .062 | 1.328 |
| | MC_FAM | -1.605 | 1.025 | 2.454 | 1 | .117 | .201 |
| | MIL_BACK | .352 | .327 | 1.159 | 1 | .282 | 1.422 |
| | NAVY_FAM | -.019 | .319 | .003 | 1 | .954 | .982 |
| | Constant | -16.285 | 2.151 | 57.299 | 1 | .000 | .000 |

Table B.6 Final Surface Warfare (SWO_SLCT) logistic regression output

**Case Processing Summary**

| Unweighted Cases [a] | | N | Percent |
|---|---|---|---|
| Selected Cases | Included in Analysis | 3300 | 100.0 |
| | Missing Cases | 0 | .0 |
| | Total | 3300 | 100.0 |
| Unselected Cases | | 0 | .0 |
| Total | | 3300 | 100.0 |

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 540.712 | 9 | .000 |
| | Block | 540.712 | 9 | .000 |
| | Model | 540.712 | 9 | .000 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 3738.593 | .151 | .208 |

**Classification Table [a]**

| | | | Predicted | | |
|---|---|---|---|---|---|
| | | | SWO Selectees | | Percentage |
| | Observed | | 0 | 1 | Correct |
| Step 1 | SWO Selectees | 0 | 1880 | 260 | 87.9 |
| | | 1 | 682 | 478 | 41.2 |
| | Overall Percentage | | | | 71.5 |

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1 [a] | SWO_EXP | .251 | .120 | 4.358 | 1 | .037 | 1.285 |
| | AVIA_EXP | -.578 | .124 | 21.659 | 1 | .000 | .561 |
| | SUB_EXP | -.307 | .144 | 4.538 | 1 | .033 | .736 |
| | USMC_EXP | -.630 | .148 | 18.104 | 1 | .000 | .533 |
| | CUM_AQPR | -.688 | .116 | 35.396 | 1 | .000 | .503 |
| | CUM_MQPR | -1.530 | .173 | 78.119 | 1 | .000 | .216 |
| | MC_FAM | -.670 | .165 | 16.474 | 1 | .000 | .512 |
| | MIL_BACK | -.299 | .105 | 8.059 | 1 | .005 | .742 |
| | GENDER | 1.203 | .117 | 105.754 | 1 | .000 | 3.331 |
| | Constant | 6.398 | .459 | 194.541 | 1 | .000 | 600.547 |

Table B.7 Final Aviation Warfare (AVI_SLCT) logistic regression output

**Case Processing Summary**

| Unweighted Cases[a] | | N | Percent |
|---|---|---|---|
| Selected Cases | Included in Analysis | 3300 | 100.0 |
| | Missing Cases | 0 | .0 |
| | Total | 3300 | 100.0 |
| Unselected Cases | | 0 | .0 |
| Total | | 3300 | 100.0 |

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 225.909 | 5 | .000 |
| | Block | 225.909 | 5 | .000 |
| | Model | 225.909 | 5 | .000 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 3969.518 | .066 | .092 |

**Classification Table [a]**

| | | | Predicted | | |
|---|---|---|---|---|---|
| | | | Aviation Selectees | | Percentage |
| | Observed | | 0 | 1 | Correct |
| Step 1 | Aviation Selectees | 0 | 2046 | 158 | 92.8 |
| | | 1 | 880 | 216 | 19.7 |
| | Overall Percentage | | | | 68.5 |

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | AVIA_EXP | .801 | .081 | 97.376 | 1 | .000 | 2.228 |
| | CUM_AQPR | .420 | .110 | 14.657 | 1 | .000 | 1.522 |
| | CUM_MQPR | .676 | .171 | 15.560 | 1 | .000 | 1.965 |
| | MC_FAM | -.452 | .159 | 8.039 | 1 | .005 | .636 |
| | GENDER | -.508 | .127 | 16.115 | 1 | .000 | .602 |
| | Constant | -4.285 | .428 | 99.988 | 1 | .000 | .014 |

Table B.8 Final Submarine Warfare (SUB_SLCT) logistic regression output

**Case Processing Summary**

| Unweighted Cases [a] | | N | Percent |
|---|---|---|---|
| Selected Cases | Included in Analysis | 3300 | 100.0 |
| | Missing Cases | 0 | .0 |
| | Total | 3300 | 100.0 |
| Unselected Cases | | 0 | .0 |
| Total | | 3300 | 100.0 |

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 468.793 | 7 | .000 |
| | Block | 468.793 | 7 | .000 |
| | Model | 468.793 | 7 | .000 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 1920.848 | .132 | .257 |

**Classification Table [a]**

| | | | Predicted | | |
|---|---|---|---|---|---|
| | | | Submarine Selectees | | Percentage |
| | Observed | | 0 | 1 | Correct |
| Step 1 | Submarine Selectees | 0 | 2879 | 33 | 98.9 |
| | | 1 | 340 | 48 | 12.4 |
| | Overall Percentage | | | | 88.7 |

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1 [a] | SWO_EXP | .288 | .142 | 4.128 | 1 | .042 | 1.334 |
| | SUB_EXP | 1.130 | .152 | 54.917 | 1 | .000 | 3.095 |
| | CUM_AQPR | 2.617 | .186 | 198.222 | 1 | .000 | 13.700 |
| | CUM_MQPR | -1.608 | .269 | 35.693 | 1 | .000 | .200 |
| | GROUP | -.790 | .078 | 101.378 | 1 | .000 | .454 |
| | MC_FAM | -.709 | .299 | 5.640 | 1 | .018 | .492 |
| | MIL_BACK | -.344 | .154 | 4.989 | 1 | .026 | .709 |
| | Constant | -3.556 | .697 | 26.055 | 1 | .000 | .029 |

Table B.9 Final Marine Corps (USMC_SEL) logistic regression output

**Case Processing Summary**

| Unweighted Cases [a] | | N | Percent |
|---|---|---|---|
| Selected Cases | Included in Analysis | 3300 | 100.0 |
| | Missing Cases | 0 | .0 |
| | Total | 3300 | 100.0 |
| Unselected Cases | | 0 | .0 |
| Total | | 3300 | 100.0 |

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 354.017 | 7 | .000 |
| | Block | 354.017 | 7 | .000 |
| | Model | 354.017 | 7 | .000 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 2760.211 | .102 | .167 |

**Classification Table[a]**

| | | | Predicted | | |
|---|---|---|---|---|---|
| | | | Marine Corps Selectees | | Percentage Correct |
| | Observed | | 0 | 1 | |
| Step 1 | Marine Corps Selectees | 0 | 2657 | 48 | 98.2 |
| | | 1 | 505 | 90 | 15.1 |
| | Overall Percentage | | | | 83.2 |

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | SWO_EXP | -.281 | .121 | 5.368 | 1 | .021 | .755 |
| | USMC_EXP | 1.050 | .123 | 72.613 | 1 | .000 | 2.857 |
| | CUM_AQPR | -1.580 | .149 | 111.949 | 1 | .000 | .206 |
| | CUM_MQPR | 1.918 | .223 | 73.711 | 1 | .000 | 6.811 |
| | GROUP | .335 | .057 | 34.315 | 1 | .000 | 1.399 |
| | MC_FAM | 1.266 | .149 | 72.390 | 1 | .000 | 3.546 |
| | NAVY_FAM | -.344 | .109 | 10.012 | 1 | .002 | .709 |
| | Constant | -4.053 | .598 | 45.943 | 1 | .000 | .017 |

Table B.10 Final Special Warfare (SEAL_SEL) logistic regression output

**Case Processing Summary**

| Unweighted Cases [a] | | N | Percent |
|---|---|---|---|
| Selected Cases | Included in Analysis | 3300 | 100.0 |
| | Missing Cases | 0 | .0 |
| | Total | 3300 | 100.0 |
| Unselected Cases | | 0 | .0 |
| Total | | 3300 | 100.0 |

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 73.273 | 6 | .000 |
| | Block | 73.273 | 6 | .000 |
| | Model | 73.273 | 6 | .000 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 534.471 | .022 | .131 |

**Classification Table[a]**

| | | | Predicted | | |
|---|---|---|---|---|---|
| | | | Special Warfare Selectees | | Percentage Correct |
| | Observed | | 0 | 1 | |
| Step 1 | Special Warfare Selectees | 0 | 3239 | 0 | 100.0 |
| | | 1 | 61 | 0 | .0 |
| | Overall Percentage | | | | 98.2 |

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | SWO_EXP | -1.171 | .371 | 9.950 | 1 | .002 | .310 |
| | AVIA_EXP | -1.294 | .351 | 13.613 | 1 | .000 | .274 |
| | SUB_EXP | -1.304 | .464 | 7.903 | 1 | .005 | .271 |
| | USMC_EXP | -1.197 | .464 | 6.646 | 1 | .010 | .302 |
| | CUM_AQPR | -.751 | .381 | 3.892 | 1 | .049 | .472 |
| | CUM_MQPR | 4.354 | .742 | 34.418 | 1 | .000 | 77.799 |
| | Constant | -15.465 | 2.024 | 58.357 | 1 | .000 | .000 |

# APPENDIX C: PRE AND POST LEAD PROGRAM ASSOCIATED DATA

Table C.1 Pre-LEAD dataset: Surface Warfare variable coefficients

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | SWO_EXP | .311 | .136 | 5.213 | 1 | .022 | 1.364 |
| | AVIA_EXP | -.749 | .140 | 28.703 | 1 | .000 | .473 |
| | SUB_EXP | -.239 | .163 | 2.152 | 1 | .142 | .787 |
| | USMC_EXP | -.885 | .176 | 25.193 | 1 | .000 | .413 |
| | CUM_AQPR | -.436 | .141 | 9.589 | 1 | .002 | .646 |
| | CUM_MQPR | -2.368 | .229 | 107.321 | 1 | .000 | .094 |
| | MC_FAM | -.641 | .188 | 11.662 | 1 | .001 | .527 |
| | MIL_BACK | -.282 | .122 | 5.343 | 1 | .021 | .755 |
| | GENDER | 1.183 | .147 | 64.800 | 1 | .000 | 3.264 |
| | Constant | 8.620 | .590 | 213.180 | 1 | .000 | 5539.346 |

Table C.2 Pre-LEAD dataset: Aviation Warfare variable coefficients

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | AVIA_EXP | .916 | .095 | 93.855 | 1 | .000 | 2.500 |
| | CUM_AQPR | .447 | .136 | 10.859 | 1 | .001 | 1.563 |
| | CUM_MQPR | .989 | .224 | 19.430 | 1 | .000 | 2.690 |
| | MC_FAM | -.580 | .188 | 9.478 | 1 | .002 | .560 |
| | GENDER | -.494 | .158 | 9.821 | 1 | .002 | .610 |
| | Constant | -5.488 | .554 | 98.136 | 1 | .000 | .004 |

Table C.3 Pre-LEAD dataset: Submarine Warfare variable coefficients

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | SWO_EXP | .107 | .190 | .316 | 1 | .574 | 1.112 |
| | SUB_EXP | 1.192 | .191 | 38.765 | 1 | .000 | 3.292 |
| | CUM_AQPR | 2.733 | .245 | 124.496 | 1 | .000 | 15.383 |
| | CUM_MQPR | -1.121 | .388 | 8.349 | 1 | .004 | .326 |
| | GROUP | -.909 | .108 | 70.470 | 1 | .000 | .403 |
| | MC_FAM | -.782 | .391 | 3.998 | 1 | .046 | .457 |
| | MIL_BACK | -.203 | .186 | 1.182 | 1 | .277 | .817 |
| | Constant | -5.515 | 1.020 | 29.251 | 1 | .000 | .004 |

Table C.4 Pre-LEAD dataset: Marine Corps variable coefficients

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | SWO_EXP | -.362 | .144 | 6.314 | 1 | .012 | .696 |
| | USMC_EXP | 1.157 | .146 | 62.794 | 1 | .000 | 3.180 |
| | CUM_AQPR | -1.822 | .186 | 96.469 | 1 | .000 | .162 |
| | CUM_MQPR | 2.202 | .288 | 58.298 | 1 | .000 | 9.044 |
| | GROUP | .344 | .067 | 26.640 | 1 | .000 | 1.410 |
| | MC_FAM | 1.338 | .172 | 60.827 | 1 | .000 | 3.810 |
| | NAVY_FAM | -.275 | .122 | 5.058 | 1 | .025 | .760 |
| | Constant | -4.427 | .754 | 34.442 | 1 | .000 | .012 |

Table C.5 Pre-LEAD dataset: Special Warfare variable coefficients

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | SWO_EXP | -1.749 | .504 | 12.028 | 1 | .001 | .174 |
| | AVIA_EXP | -1.711 | .422 | 16.400 | 1 | .000 | .181 |
| | SUB_EXP | -1.354 | .509 | 7.091 | 1 | .008 | .258 |
| | USMC_EXP | -1.429 | .558 | 6.555 | 1 | .010 | .240 |
| | CUM_AQPR | -1.001 | .470 | 4.533 | 1 | .033 | .368 |
| | CUM_MQPR | 5.794 | .999 | 33.672 | 1 | .000 | 328.437 |
| | Constant | -19.713 | 2.759 | 51.057 | 1 | .000 | .000 |

Table C.6 Post-LEAD dataset: Surface Warfare variable coefficients

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | SWO_EXP | .765 | .332 | 5.313 | 1 | .021 | 2.149 |
| | AVIA_EXP | .551 | .340 | 2.623 | 1 | .105 | 1.735 |
| | SUB_EXP | .157 | .378 | .173 | 1 | .677 | 1.170 |
| | USMC_EXP | .697 | .355 | 3.857 | 1 | .050 | 2.008 |
| | CUM_AQPR | -.014 | .263 | .003 | 1 | .959 | .987 |
| | CUM_MQPR | -1.801 | .369 | 23.850 | 1 | .000 | .165 |
| | MC_FAM | -.779 | .382 | 4.154 | 1 | .042 | .459 |
| | MIL_BACK | -.437 | .230 | 3.614 | 1 | .057 | .646 |
| | GENDER | 1.500 | .206 | 53.041 | 1 | .000 | 4.481 |
| | Constant | 3.928 | .879 | 19.979 | 1 | .000 | 50.794 |

Table C.7 Post-LEAD dataset: Aviation Warfare variable coefficients

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | AVIA_EXP | .467 | .162 | 8.296 | 1 | .004 | 1.595 |
| | CUM_AQPR | -.112 | .227 | .242 | 1 | .623 | .894 |
| | CUM_MQPR | .692 | .326 | 4.488 | 1 | .034 | 1.997 |
| | MC_FAM | -.148 | .308 | .230 | 1 | .632 | .863 |
| | GENDER | -.570 | .215 | 7.069 | 1 | .008 | .565 |
| | Constant | -2.481 | .739 | 11.264 | 1 | .001 | .084 |

Table C.8 Post-LEAD dataset: Submarine Warfare variable coefficients

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | SWO_EXP | .526 | .221 | 5.669 | 1 | .017 | 1.693 |
| | SUB_EXP | .998 | .257 | 15.127 | 1 | .000 | 2.713 |
| | CUM_AQPR | 1.806 | .319 | 32.007 | 1 | .000 | 6.088 |
| | CUM_MQPR | -1.288 | .443 | 8.463 | 1 | .004 | .276 |
| | GROUP | -.624 | .117 | 28.566 | 1 | .000 | .536 |
| | MC_FAM | -.565 | .468 | 1.459 | 1 | .227 | .569 |
| | MIL_BACK | -.673 | .286 | 5.545 | 1 | .019 | .510 |
| | Constant | -2.064 | 1.022 | 4.080 | 1 | .043 | .127 |

Table C.9 Post-LEAD dataset: Marine Corps variable coefficients

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | SWO_EXP | -.152 | .230 | .440 | 1 | .507 | .859 |
| | USMC_EXP | .695 | .235 | 8.716 | 1 | .003 | 2.004 |
| | CUM_AQPR | -1.355 | .299 | 20.487 | 1 | .000 | .258 |
| | CUM_MQPR | 1.934 | .430 | 20.242 | 1 | .000 | 6.917 |
| | GROUP | .293 | .113 | 6.690 | 1 | .010 | 1.341 |
| | MC_FAM | 1.050 | .312 | 11.344 | 1 | .001 | 2.858 |
| | NAVY_FAM | -.489 | .273 | 3.215 | 1 | .073 | .613 |
| | Constant | -4.348 | 1.061 | 16.806 | 1 | .000 | .013 |

Table C.10 Post-LEAD dataset: Special Warfare variable coefficients

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | SWO_EXP | .213 | .835 | .065 | 1 | .799 | 1.237 |
| | AVIA_EXP | .093 | .854 | .012 | 1 | .913 | 1.098 |
| | SUB_EXP | -1.005 | 1.238 | .659 | 1 | .417 | .366 |
| | USMC_EXP | -.401 | 1.017 | .156 | 1 | .693 | .670 |
| | CUM_AQPR | -1.462 | .761 | 3.690 | 1 | .055 | .232 |
| | CUM_MQPR | 3.612 | 1.253 | 8.307 | 1 | .004 | 37.051 |
| | Constant | -11.087 | 3.246 | 11.668 | 1 | .001 | .000 |

Table C.11 Variable mean values: Pre-LEAD dataset

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| SWO_EXP Mid was most exposed to SWOs | 2464 | 0 | 1 | .26 | .44 |
| AVIA_EXP Mid was most exposed to Aviators | 2464 | 0 | 1 | .30 | .46 |
| SUB_EXP Mid was most exposed to Submariners | 2464 | 0 | 1 | .14 | .34 |
| USMC_EXP Mid was most exposed to marines | 2464 | 0 | 1 | .12 | .33 |
| SEAL_EXP Mid was most exposed to SEALs | 2464 | 0 | 1 | 2.07E-02 | .14 |
| CUM_AQPR | 2464 | 2.01 | 4.00 | 2.8723 | .4618 |
| CUM_MQPR | 2464 | 2.28 | 3.99 | 3.2647 | .2894 |
| GROUP | 2464 | 1 | 3 | 1.96 | .87 |
| GENDER | 2464 | 0 | 1 | .11 | .31 |
| MC_FAM Marine Corps background in family | 2464 | 0 | 1 | 7.67E-02 | .27 |
| NAVY_FAM background of Navy in family | 2464 | 0 | 1 | .37 | .48 |
| MIL_BACK military background in family, non-naval service | 2464 | 0 | 1 | .19 | .40 |
| Valid N (listwise) | 2464 | | | | |

Table C.12 Variable mean values: Post-LEAD dataset

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| SWO_EXP Mid was most exposed to SWOs | 836 | 0 | 1 | .30 | .46 |
| AVIA_EXP Mid was most exposed to Aviators | 836 | 0 | 1 | .27 | .44 |
| SUB_EXP Mid was most exposed to Submariners | 836 | 0 | 1 | .15 | .36 |
| USMC_EXP Mid was most exposed to marines | 836 | 0 | 1 | .17 | .38 |
| SEAL_EXP Mid was most exposed to SEALs | 836 | 0 | 1 | 2.87E-02 | .17 |
| CUM_AQPR | 836 | 2.07 | 4.00 | 2.9811 | .4531 |
| CUM_MQPR | 836 | 2.14 | 3.90 | 3.1181 | .3192 |
| GROUP | 836 | 1 | 3 | 2.05 | .87 |
| GENDER | 836 | 0 | 1 | .16 | .37 |
| MC_FAM Marine Corps background in family | 836 | 0 | 1 | 6.46E-02 | .25 |
| NAVY_FAM background of Navy in family | 836 | 0 | 1 | .20 | .40 |
| MIL_BACK military background in family, non-naval service | 836 | 0 | 1 | .18 | .38 |
| Valid N (listwise) | 836 | | | | |

Table C.13 Surface Warfare marginal effects tables

| **SERVICE SELECTION INFLUENCES:** | | **SURFACE SELECTEES (PRE-LEAD)** | | |
|---|---|---|---|---|
| | | MARGINAL EFFECTS AT MEAN VALUES: | | |
| VARIABLE | XBAR | LOGIT | X*LOGIT | MARGINAL LOGIT*P(1-P) |
| Constant | **1** | 8.62 | 8.62 | |
| SUB_EXP | **0.14** | -0.239 | -0.03346 | -0.054369108 |
| SWO_EXP | **0.26** | 0.311 | 0.08086 | 0.070748087 |
| CUM_AQPR | **2.8723** | -0.436 | -1.2523228 | -0.099183813 |
| CUM_MQPR | **3.2647** | -2.368 | -7.7308096 | -0.538686397 |
| USMC_EXP | **0.12** | -0.885 | -0.1062 | -0.201324941 |
| MC_FAM | **0.0767** | -0.641 | -0.0491647 | -0.145818404 |
| MIL_BACK | **0.19** | -0.282 | -0.05358 | -0.064150998 |
| AVIA_EXP | **0.3** | -0.749 | -0.2247 | -0.170386871 |
| GENDER | **0.11** | 1.183 | 0.13013 | 0.269115713 |
| | **P=1/(1+e^-Z)** **0.349952706** | | Z=S(X*LOGIT) -0.6192471 | |

| **SERVICE SELECTION INFLUENCES:** | | **SURFACE SELECTEES (POST-LEAD)** | | |
|---|---|---|---|---|
| | | MARGINAL EFFECTS AT MEAN VALUES: | | |
| VARIABLE | XBAR | LOGIT | X*LOGIT | MARGINAL LOGIT*P(1-P) |
| Constant | **1** | 3.928 | 3.928 | |
| SUB_EXP | **0.15** | 0.157 | 0.02355 | 0.029444938 |
| SWO_EXP | **0.3** | 0.765 | 0.2295 | 0.143473744 |
| CUM_AQPR | **2.9811** | -0.014 | -0.0417354 | -0.002625663 |
| CUM_MQPR | **3.1181** | -1.801 | -5.6156981 | -0.337772826 |
| USMC_EXP | **0.17** | 0.697 | 0.11849 | 0.130720522 |
| MC_FAM | **0.0646** | -0.779 | -0.0503234 | -0.146099407 |
| MIL_BACK | **0.18** | -0.437 | -0.07866 | -0.081958204 |
| AVIA_EXP | **0.27** | 0.551 | 0.14877 | 0.103338605 |
| GENDER | **0.16** | 1.5 | 0.24 | 0.281321066 |
| | **P=1/(1+e^-Z)** **0.250094772** | | Z=S(X*LOGIT) -1.0981069 | |

Table C.14 Aviation Warfare marginal effects tables

| **SERVICE SELECTION INFLUENCES:** | | **AVIATION SELECTEES (PRE-LEAD)** | | |
|---|---|---|---|---|
| | | MARGINAL EFFECTS AT MEAN VALUES: | | |
| VARIABLE | XBAR | LOGIT | X*LOGIT | MARGINAL LOGIT*P(1-P) |
| Constant | **1** | -5.488 | -5.488 | |
| CUM_AQPR | **2.8723** | 0.447 | 1.2839181 | 0.095642347 |
| CUM_MQPR | **3.2647** | 0.989 | 3.2287883 | 0.211611367 |
| MC_FAM | **0.0767** | -0.58 | -0.044486 | -0.124099689 |
| AVIA_EXP | **0.3** | 0.916 | 0.2748 | 0.195991923 |
| GENDER | **0.11** | -0.494 | -0.05434 | -0.105698701 |
| | **P=1/(1+e^-Z)** **0.310171082** | | Z=S(X*LOGIT) -0.7993196 | |

| **SERVICE SELECTION INFLUENCES:** | | **AVIATION SELECTEES (POST-LEAD)** | | |
|---|---|---|---|---|
| | | MARGINAL EFFECTS AT MEAN VALUES: | | |
| VARIABLE | XBAR | LOGIT | X*LOGIT | MARGINAL LOGIT*P(1-P) |
| Constant | **1** | -2.481 | -2.481 | |
| CUM_AQPR | **2.9811** | -0.112 | -0.3338832 | -0.02538148 |
| CUM_MQPR | **3.1181** | 0.692 | 2.1577252 | 0.156821289 |
| MC_FAM | **0.0646** | -0.148 | -0.0095608 | -0.033539813 |
| AVIA_EXP | **0.27** | 0.467 | 0.12609 | 0.105831708 |
| GENDER | **0.16** | -0.57 | -0.0912 | -0.129173605 |
| | **P=1/(1+e^-Z)** **0.347095979** | | Z=S(X*LOGIT) -0.6318288 | |

Table C.15 Submarine Warfare marginal effects tables

| **SERVICE SELECTION INFLUENCES:** | | **SUBMARINE SELECTEES (PRE-LEAD)** | | |
|---|---|---|---|---|
| | | MARGINAL EFFECTS AT MEAN VALUES: | | |
| VARIABLE | XBAR | LOGIT | X*LOGIT | MARGINAL LOGIT*P(1-P) |
| Constant | **1** | -5.515 | -5.515 | |
| SUB_EXP | **0.14** | 1.192 | 0.16688 | 0.053354367 |
| SWO_EXP | **0.26** | 0.107 | 0.02782 | 0.00478936 |
| CUM_AQPR | **2.8723** | 2.733 | 7.8499959 | 0.122330105 |
| CUM_MQPR | **3.2647** | -1.121 | -3.6597287 | -0.05017638 |
| GROUP | **1.96** | -0.909 | -1.78164 | -0.040687181 |
| MC_FAM | **0.0767** | -0.782 | -0.0599794 | -0.035002613 |
| MIL_BACK | **0.19** | -0.203 | -0.03857 | -0.009086356 |
| | **P=1/(1+e^-Z)** **0.046966199** | | Z=S(X*LOGIT) -3.0102222 | |

| **SERVICE SELECTION INFLUENCES:** | | **SUBMARINE SELECTEES (POST-LEAD)** | | |
|---|---|---|---|---|
| | | MARGINAL EFFECTS AT MEAN VALUES: | | |
| VARIABLE | XBAR | LOGIT | X*LOGIT | MARGINAL LOGIT*P(1-P) |
| Constant | **1** | -2.064 | -2.064 | |
| SUB_EXP | **0.15** | 0.998 | 0.1497 | 0.119270286 |
| SWO_EXP | **0.3** | 0.526 | 0.1578 | 0.062861894 |
| CUM_AQPR | **2.9811** | 1.806 | 5.3838666 | 0.215833805 |
| CUM_MQPR | **3.1181** | -1.288 | -4.0161128 | -0.153927985 |
| USMC_EXP | **2.05** | -0.624 | -1.2792 | -0.074573806 |
| MC_FAM | **0.0646** | -0.565 | -0.036499 | -0.067522757 |
| MIL_BACK | **0.18** | -0.673 | -0.12114 | -0.080429762 |
| | **P=1/(1+e^-Z)** **0.138765042** | | Z=S(X*LOGIT) -1.8255852 | |

Table C.16 Marine Corps marginal effects tables

| **SERVICE SELECTION INFLUENCES:** | | **MARINE CORPS SELECTEES (PRE-LEAD)** | | |
|---|---|---|---|---|
| | | MARGINAL EFFECTS AT MEAN VALUES: | | |
| VARIABLE | XBAR | LOGIT | X*LOGIT | MARGINAL LOGIT*P(1-P) |
| Constant | **1** | -4.427 | -4.427 | |
| SWO_EXP | **0.26** | -0.362 | -0.09412 | -0.045606516 |
| NAVY_FAM | **0.37** | -0.275 | -0.10175 | -0.034645834 |
| MC_FAM | **0.0767** | 1.338 | 0.1026246 | 0.168567731 |
| USMC_EXP | **0.12** | 1.157 | 0.13884 | 0.145764473 |
| GROUP | **1.96** | 0.344 | 0.67424 | 0.043338789 |
| CUM_AQPR | **2.8723** | -1.822 | -5.2333306 | -0.229544399 |
| CUM_MQPR | **3.2647** | 2.202 | 7.1888694 | 0.277418642 |
| | **P=1/(1+e^-Z)** **0.147842154** | | Z=S(X*LOGIT) -1.7516266 | |

| **SERVICE SELECTION INFLUENCES:** | | **MARINE CORPS SELECTEES (POST-LEAD)** | | |
|---|---|---|---|---|
| | | MARGINAL EFFECTS AT MEAN VALUES: | | |
| VARIABLE | XBAR | LOGIT | X*LOGIT | MARGINAL LOGIT*P(1-P) |
| Constant | **1** | -4.348 | -4.348 | |
| SWO_EXP | **0.3** | -0.152 | -0.0456 | -0.019663775 |
| NAVY_FAM | **0.2** | -0.489 | -0.0978 | -0.063260433 |
| MC_FAM | **0.0646** | 1.05 | 0.06783 | 0.135835286 |
| USMC_EXP | **0.17** | 0.695 | 0.11815 | 0.089910023 |
| GROUP | **2.05** | 0.293 | 0.60065 | 0.037904513 |
| CUM_AQPR | **2.9811** | -1.355 | -4.0393905 | -0.175292203 |
| CUM_MQPR | **3.1181** | 1.934 | 6.0304054 | 0.250195661 |
| | **P=1/(1+e^-Z)** **0.152677296** | | Z=S(X*LOGIT) -1.7137551 | |

THIS PAGE INTENTIONALLY LEFT BLANK

# BIBLIOGRAPHY


Aaker, D.A. (1996). Building strong brands. New York: Free Press.

Barber, A.E. (1998). Recruiting Employees: Individual and Organizational Perspectives. Thousand Oaks, CA: Sage Publications.

Bowman, W.R. (1995). Cost-Effectiveness of Service Academies: New Evidence From Navy Warfare Communities. Economics Department and Office of Institutional Research: United States Naval Academy, Annapolis, Maryland.

COMDTMIDN INSTRUCTION 1301.1 (24 AUG 98), SERVICE ASSIGNMENT, Department of the Navy, United States Naval Academy

COMDTMIDN INSTRUCTION 5370.2 (9 AUG 96), COMPANY OFFICER HANDBOOK, Department of the Navy, United States Naval Academy

Gatewood, R.D., Gowan, M.A., & Lautenschlager. G.J. (1993). Corporate image, recruitment image, and initial job choice decisions. *Academy of Management Journal*, **36**, 414-427.

Keller, J.W., Piotrowski, C., & Rabold, F.L. (1990). Determinates of Career Selection in Undergraduates. *Journal of College Student Development*, **31**, 276-277.

Montana P.J., & Higginson M.V. (1978) Career Life Planning for Americans. New York: AMACOM.

Memorandum of Agreement Between the United States Naval Academy and the Naval Postgraduate School; USNA 'Leadership Education and Development Program Curriculum', 07 November 1996.

Phillips, S.D., Christopher-Sisk, E.K., & Gravino K.L. (2001) Making Career Decisions in a Relational Context. *The Counseling Psychologist*, **29**, 193-213.

Powell, G.N. (1991). Applicant reaction to the initial employment interview: Exploring theoretical and methodological issues. *Personnel Psychology*, **44**, 67-83.

Rynes S.L., & Miller H.E. (1983) Recruiter and Job Influences on Candidates for Employment. *Journal of Applied Psychology*, **69**, 147-154.

Towhey, J.R. (2002, February 17). Midshipmen Choose Next Step: Seniors get ready for career in Navy after graduation. The Capital. p. C1.

Turban, D.B. (2001). Organizational Attractiveness as an Employer on College Campuses: An Examination of the Applicant Population. *Journal of Vocational Behavior*, **58**, 293-312.

Turban D.B., & Dougherty T.W. (1992) Influences of Campus Recruiting on Applicant Attraction to Firms. *Academy of Management Journal*, **35**, 739-765.

Turban, D.B., Forret, M.L. & Hendrickson, C.L. (1998). Applicant attraction to firms: Influences of organization reputation, job and organizational attributes, and recruiter behaviors. *Journal of Vocational Behavior*, **52**, 24-44.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, **185**, 1124-1131.

Zajonc R.B. (1968). The attitudinal effects of mere exposure. *Journal of Personality and Social Psychology*, **9**, 1-27.

# INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
   Ft. Belvoir, Virginia

2. Dudley Knox Library
   Naval Postgraduate School
   Monterey, California

3. Nimitz Library
   U.S. Naval Academy
   Annapolis, Maryland

4. Superintendent
   United States Naval Academy
   Annapolis, Maryland

5. Commandant of Midshipmen
   United States Naval Academy
   Annapolis, Maryland

6. LEAD Program
   Annapolis, Maryland

7. United States Naval Academy
   Office of Institutional Research
   Stop 2B
   Annapolis, Maryland

8. Dr. Stephen Mehay
   School of Business and Public Policy
   Naval Postgraduate School
   Monterey, California

9. Dr. John E. Fredland
   Economics Department
   Annapolis, MD

10. LT Matthew G. Gille
    Arnold, Maryland

11. Dr. and Mrs. Gerald Gille II
    Fairfield, Ohio